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NOTES FROM THE HISTORICAL AND POLITICAL SCIENCE ASSOCIATION.

THE WABASH TRADE ROUTE: EARLY PERIOD.

By E. J. BENTON.

[Abstract of a paper read before the Historical and Political Science Association, January 10, 1902.]

In the long contest between the French and English for the great interior territory South of the Great Lakes, the former had the advantage of a series of connecting waterways. The soldier, the priest and the trader made the greatest possible use of the many interlinking streams with their connecting portages. The earliest expeditions followed up the Ottawa river and pushed across to the upper lakes, and thence to the Southwest by the Fox river or the Chicago portages into the Mississippi basin. It was the most remote route which was practicable, but it was the line of least resistance. The lower lakes and the Niagara portage were avoided because of the danger from predatory expeditions of the hostile Iroquois Indians. But in rapid succession shorter routes were employed; each drawing the cordon tighter over the territory which the English settlers were hastening to claim.

Of the five great portages, or carrying places, connecting streams leading into the lakes with those flowing into the Mississippi valley, the Fox-Wisconsin portage, the Chicago-Illinois, St. Joseph-Kaupakee, St. Joseph-Wabash, and the Maumee-Wabash, the latter, extending from the West head of Lake Erie up the Maumee valley and across a short portage into the Wabash river and from thence to the Louisiana settlements, was of the utmost strategic importance to the French. The colonial system of that people, a system involving great undeveloped areas, demanded a direct course for travel and trade between its empire on the lower Mississippi and New France. Its loosely centralized control was only possible by constant use of these connecting waterways. This place the Wabash route supplied. Gradually a chain of forts and trading posts—Detroit, Fort Miami, Quiatenon, and Vincennes—came to make its use safer and more valuable.

After the English wrested from the French the latter's settlements in America, Detroit and Vincennes continued to be important ports on the route to the southwest. It was over this that supplies and reënforcements were being sent to the relief of General Hamilton at Vincennes when the whole expedition was captured by George Rogers Clark. However, the British occupation of the frontier posts after the Revolution and the hostility of the neighboring Indians turned the western immigrant away from the lake region for many years. Other channels took its place in directing the course of immigration. The bulk of the settlers bound for the Northwest moved by Pittsburg to the Ohio valley until the construction of the Wabash canal gave the Wabash route once more its former conspicuous place.

The evolution of such an artificial waterway as a part of a great trunk system binding the Old Northwest to New York is a factor of considerable importance in the growth and nationalization of the United States. Peter Buell Porter, a representative in the eleventh Congress from Western New York, became one of the earliest champions of a system of roads and canals which should form a chain of communication across his state to the western territories. His speech in Congress is an argument for opening up markets in the West and to show the moral effect of the idleness resulting where there was no incentive to work because of inadequate markets. Economic forces and military needs combined to make such a plan both popular and certain of final consummation. The sentiment demanding a system of internal improvements became particularly strong in the rapidly growing state of Indiana. The purpose of the promoters of such a scheme is doubtless correctly expressed when a local newspaper said: "Not only would our markets improve from the facilities to send off our produce, cash flow in, instead of out, as is the case now, and merchandise be cheaper, but the whole section of country from here to the Lake, which is now scarcely less than a wilderness, would become a thickly populated region, of enterprise, industry and happiness."

But the state lacked the means even to make the surveys necessary to test the practicability of the canal and the movement was of necessity carried to the federal Congress, a body just then begining to show itself ready to aid such enterprises. Congress was ultimately induced to assist by a grant of the alternate sections of land for a distance of five miles back from the proposed route of the canal on each side extending throughout its entire length. With this as a fiscal nucleus the states of Ohio and Indiana undertook jointly to connect the waters of Lake Erie with those of the Mississippi.

THE MARYLAND CONSTITUTION OF 1851.

By J. W. Harry.

[Abstract of a paper read before the Historical and Political Science Association, November 22, 1901.]

The Constitution of 1851 marks an epoch in the history of the state. It was the result of a struggle on the part of the counties of Western Maryland and Baltimore City for equal representation in the General Assembly.

The state had become a government of the minority. The smaller counties of Southern Maryland and of the Eastern Shore, though in the minority in respect to population, still had a majority of the representatives in the General Assembly. The framers of the Constitution of 1776 gave to the Legislature the power to propose and make constitutional amendments. This power had been exercised in a most conservative manner. For a quarter of a century the dominant feature in the political history of the state was the agitation over calling a convention to make a new constitution: a constitution which should more justly apportion representation among the counties and Baltimore City; and remedy other defects which had become apparent in the Constitution of 1776. The General Assembly strenously resisted every effort made to secure legislative sanction to a convention. It considered that a convention would be an infringement of its prerogatives and without constitutional warrant. It was not until revolution threatened the state, that the Legislature passed an act, which authorized the popular vote to be taken in reference to a convention. The referendum resulted in a large majority in favor of a convention.

The articles of the constitution which gave to the Legislature power to make amendments, were not repealed. This fact gives the convention of 1851, a revolutionary or extra-constitutional character.

A strong effort was made in the convention to secure the recognition of the right of the Eastern Shore to secede from the state and unite with the state of Delaware. A similar attempt had been made by the Eastern Shore in the convention of 1776. In that convention certain privileges were granted to that part of the state, among which was a provision requiring a vote of two-thirds majority in the Legislature, at two successive sessions, to make any amendment to the constitution touching the interest of the Eastern Shore. For the rest of the state only a majority vote was required.

The Constitution of 1851 is remarkable for its extremely democratic features. All public officials, judicial and civil, were to be elected directly by popular vote. The Judiciary was completely reorganized, and changed from an appointive to an elective system.

For the first time in the history of the state, representation in the General Assembly was apportioned among the counties on the basis of the aggregate population. Baltimore City received an increase in her representation, from one-sixteenth to one-eighth of the total number of representatives in the General Assembly. The power of the Legislature was strictly defined and limited by the constitution. The Legislature was required to order a vote of the people to be taken every ten years on the question of calling a convention to amend the constitution. The object of this was to deprive the Legislature of any control over the constitution. Imprisonment for debt was abolished. Liberal provisions were made in regard to homestead exemption. The power to grant divorces was taken from the Legislature and given to the courts of equity. Such new features embodied in the constitution did much to meet the altered conditions of the state.

TRUST COMPANIES IN THE UNITED STATES.

By George Cator.

[Abstract of a paper read before the Historical and Political Science Association, October 11, 1901.]

This paper is a short discussion, historical, critical and descriptive, of Trust Companies. The appendices contain tables of statistics of the companies in a number of the states and schedules indicating to some extent their legal status for the whole country. The use of the term "trust" is traced in the titles of different institutions, and attention is called to the fact that often this word has had no particular significance in corporate names.

The first corporation in the United States to act as trustee appears to have been the Farmers' Loan and Trust Company of New York, which was chartered in 1822 as a fire insurance and loan company, and later in the same year was empowered to execute all lawful trusts. The company, known as the Pennsylvania Company for the Insurance on Lives, etc. and located in Philadelphia, was chartered in 1812, but not until 1836 was it authorized to act as trustee. At first the trust business was conducted by insurance companies, and even after it began to be carried on by separate companies, for a long period no distinction was made in the public mind between trust and insurance business.

Gradually trust companies built up large banking departments, although the power to do banking was strictly forbidden to the early corporations which acted as trustees. About 1873 the new institution appeared to attract wider attention. Ten or twelve years later its great development began, and at the same time complaints on the part of the banks became decidedly pronounced. It was especially observed that large deposits of a certain class, which had been carried with the discount banks without interest were growing less in amount and fewer in number, and it was believed that the trust companies were the cause of the trouble. Complaints are still heard on this account, but not as much as formerly. In some quarters, indeed, where there was hostile criticism, there is now favorable comment. The change of sentiment in this matter is possibly due to the fact that the permanency of the new institution is now recognized and that the different interests involved have become more or less closely allied.

Trust companies have developed to a large extent without the restrictions to which the banks have been subjected, and they owe their success in part to this freedom from restraint. In some states they have now been placed under supervision much like that provided for banks, in others they have yet been brought under little or no regulation. If it is admitted that banks not exercising the right of note issue should receive regulation, and if trust companies can and do perform all the functions of such banks, then it is difficult to see why they should escape the same legal exactions. Nevertheless, where action is to be taken on this account, there should not be a sudden and radical change of policy. In the beginning a conservative course seems to be the wise one, and later when it becomes necessary, more stringent measures may be adopted.

To some extent trust companies have been formed and successfully operated in the smaller towns, but it is in the large financial centres that they have more especially developed. Formerly the right of note issue was paramount in the banking business. Later, however, the case has somewhat altered, and it is readily seen how trust companies have been aided in their growth by the increased importance of the deposit system, for the monopoly of banks of issue is no longer of the same great advantage.

As has been remarked, trust companies have been favored in a great respect by freedom from restraint. By this means they have been enabled better than the restricted banks to finance the great schemes, which the industrial changes and the rapid development of the country have required to be undertaken. Conditions in general have made a place for an institution which advances large sums in a single venture.

Among other functions which they now perform, trust companies execute various trusts, manage estates and promote enterprises. These different matters are briefly discussed in the paper, and comments are made as to the relative advantages of having corporations or individuals act in such capacities and also as to the responsibilities of the offices assumed.

Trust companies often conduct a safe deposit business. This feature may be conveniently carried on by almost any financial institution in connection with its other departments, or it may be conducted by a separate corporation, as is usually the case in New York. In some states trust companies insure titles of property, in some they act as bondsmen. Generally the fidelity companies are distinct concerns which make bonding their main business, and do not act as trustees; in the public mind, however, they are all regarded as belonging to the same class.

Trust companies engage in general banking operations. They do not restrict their deposits to trust funds, but often solicit and receive the kinds which are sought by other banks. As yet the old savings banks have a strong hold upon a certain class of depositors, which probably they will long retain; nevertheless even in this direction their rivals are likely in time to make gains by offering higher rates of interest and attractive inducements in the way of greater conveniences. The small savings banks will be placed at considerable disadvantage in the competition.

At present the trust companies confine for the most part their call and time loans to those secured by collaterals. They advance relatively small amounts on personal security; many of them, in fact, do not discount paper at all, leaving the business entirely to the regular discount banks which largely employ their capital in this way. Having first entered the field and enjoying the prestige, the old banks may be expected at least for some time to hold their monopoly. Even with discrimination against them, banks of issue will continue to have a place in the business world; but from the outlook now it would seem that in the formation of new financial concerns the tendency will be rather to organize them on the basis which affords the widest scope of action, and that the trust company appears at present to be an institution which fulfills this requirement.

In conclusion the following may be mentioned as among the causes for the development of trust companies:

(1) The extended use in general of corporations; (2) The growth of investments in government and corporate securities; (3) The increased importance of deposits relative to the issue of bank notes; (4) The place for an institution that is comparatively free from restraint and may make large advances in a single venture.

SOCIAL PROGRESS AND THE POLICE POWER OF A STATE.

By B. J. Ramage.

[Abstract of a paper read before the Historical and Political Science Association, January 24, 1902.]

It was the object of this paper to show the relation between social progress and the constitutional law of the United States. Attention was first directed to the rapid extension of the principle of State interference and the growing tendency towards uniformity in the legislation of all our commonwealths. Owing to the division of sovereignty in this country between the states and nation, the duty is imposed on the former to pass laws for the purpose of meeting the ever-changing demands of advancing civilization. The power of legislation thus reserved by the several states is what is known as its "police power," an expression that has never yet been satisfactorily defined. Certain limitations which were briefly indicated are imposed on its exercise, both by local constitutions and the supreme law of the land. To the various courts, state and federal, is committed the task of deciding the constitutionality of every statute whose validity may thus be drawn in question. Hence the development of the police power is to be traced rather in the decisions of the courts than in the history of commonwealth legislation.

It was then shown that the word "police" is used by continental publicists in a very comprehensive sense, and includes numerous branches of administrative law. In America the term is employed more technically, because of the presence of written constitutions. It has little to do with a municipal constabulary, but rather indicates that function of government which cares for the health, safety, morals, and general welfare of a community.

Some commonwealths endeavor to restrain the power of the judiciary to set aside statutes, either by incorporating in their constitutions the more important branches of social legislation or providing means whereby proposed measures can have their solidity tested in advance of their adoption. Cases illustrating the manner in which various state courts regard social legislation were then analyzed, after which attention was called to a few celebrated decisions of the federal supreme court which involved the exercise of the police power.

It seems that the occasions for conflict between the exercise of the police power and the sovereignty of the nation are comparatively rare. The grounds on which the social legislation of the states are usually assailed are, (1) that it regulates foreign or interstate commerce; (2) impairs the obligation of a contract, or, (3) violates the "equality" clause of the XIV Amendment. Under the first head come numerous cases that draw in question quarantine regulations, prohibition laws, inspection measures, and legislation affecting immigration, to say nothing of acts fixing the maximum charges of transportation companies. In like manner statutes regulating corporations are often assailed on the ground that they impair the obligations of contracts. Finally, we have a multitude of cases arising under the XIV Amendment, which was designed to limit the police power. Laws regulating certain employments, for example, are often attacked on the ground that they violate the "equality" clause of this amendment and amount to "class legislation." But there is a growing tendency on the part of some tribunals, notably the highest courts of Massachusetts and New York, as well as the supreme court of the United States—to construe most liberally the various acts passed under the police power. Some decisions go so far indeed as to hold that there are no other limits to its exercise than those imposed by state constitutions and the supreme law of the land. Through judicial interpretation this power is now frequently extended to the protection of a class.

In conclusion, a study of the development of the police power under our altered social conditions leads to the belief that there is an effort on the part of the judiciary to make legal conceptions harmonize with the interests of society. It is true that our federal system encounters inconveniences unknown to countries whose fundamental law rests on custom and whose system of legislation is unified. With us the same battle in behalf of social reform frequently must be fought not once, but at least fifty times. But we are not to overlook some advantages enjoyed by our plan of government. (1) We have opportunities for experimenting with legislation on a small scale which might sometimes prove disastrous if attempted by the nation. (2) The police power of the states, as interpreted by state and federal courts, makes allowance for the varying needs of communities whose climate, industries, and civilization may often give rise to local questions. At the same time there is in the supreme sovereignty of the nation sufficient coercive authority to prevent the exercise of this power in such a manner as to become oppressive or dangerous. Meanwhile, the jurisdiction of our courts serves as a restraining influence in times of popular excitement or impatience, and so far from hindering progress may be looked upon as the very check true progress often requires.

A HISTORY

OF

SLAVERY IN VIRGINIA

BY

JAMES CURTIS BALLAGH, PH. D.

Associate in History in the Johns Hopkins University.

160 pages. 8o. Cloth. $1.50.

This volume presents the results of an extended investigation of the institutional character of American slavery. Entirely new conclusions are reached as to its origin and development in the English colonies. The relation of slavery as a form of labor and of social dependence to similar forms in Europe and America is shown.

The important position of Virginia as a colony and a State and her influence upon the South make a minute study of the status of her dependent classes of general as well as of local interest. A comprehensive history of the legal and customary treatment of slaves in Virginia to the period of emancipation is here given for the first time.

The work is chiefly based upon contemporary documents and manuscripts, state and county archives, and transcripts from the British Public Record Office. It is well indexed.

THE JOHNS HOPKINS PRESS,
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MORRIS CRATER SUTPHEN,

May 4, 1869—August 31, 1901.

Morris Crater Sutphen, Instructor in Latin in the Johns Hopkins University, met his death by drowning on the evening of Saturday, August 31, 1901. He was returning from a day's trip with a few friends when the small cat-boat containing the party accidentally struck Highlands Bridge, which spans the Shrewsbury river near Oceanic, New Jersey, and was instantly capsized. All except Dr. Sutphen clung to the boat and were eventually saved. No danger, however, for him was apprehended, as he was known to be a strong swimmer and as the shore was scarcely two hundred feet away. But after a brief interval he was observed to sink suddenly and without a struggle. He was buried at Morristown, New Jersey, the home of his parents, Eleanor B. and the late Morris S. Sutphen, D. D.

Dr. Sutphen was born in the city of New York on the fourth of May, 1869, and received the degree of Bachelor of Arts from Princeton University in 1890. The next four years he spent as a teacher in the Morris Academy, at Morristown. Meanwhile he received the Master's degree from Princeton in 1893. In the fall of 1894 he entered the Johns Hopkins University, accepting, after three years of advanced work in the classics, the position of Instructor of Latin in Williams College. Two years later he returned, and in June, 1899, was given the degree of Doctor of Philosophy by this University, and, shortly after, the appointment of Instructor in Latin.

He was at once associated in the graduate work, lecturing upon a subject suggested by his dissertation, "A Study of the Diction and Phraseology of Lucius Annaeus Seneca with especial reference to the *Sermo Cotidianus*." As an investigator, his most important work was an article entitled *A Further Collection of Latin Proverbs*, now appearing in the *American Journal of Philology*. Another article on *Magic in Theokritos and Vergil* was his contribution to the recently published *Studies in Honor of Basil Lanneau Gildersleeve*. His interest in this book was deep and personal, and as secretary and treasurer of the editorial committee he gave ungrudgingly of his time, energy and enthusiasm.

At a meeting of the Board of University Studies, January 15, 1902, a committee appointed to draft appropriate resolutions made the following report:

> The Board of University Studies is compelled with sorrow to record the death of Dr. Morris Crater Sutphen, Instructor in Latin in this University for the past two years.
>
> As a man Dr. Sutphen won the affection and respect of all those who knew him best. As a scholar, the brilliant promise of his student days was more than justified in the brief season of fruitage that was to be his.
>
> His high ideals of life and work and his winning personality were bringing him marked success as a teacher of undergraduates. In the graduate work he was equally successful and as a scientific investigator in the field of classical philology his fine literary taste, his tireless energy and his ardent enthusiasm were rapidly winning him recognition.
>
> It was his to meet a tragic death in the very season of youth and hope. Few, in such a brief compass of time, have accomplished as much, fewer still, have accomplished more.
>
> The members of this Board desire to extend to Mrs. Sutphen and her family their heartfelt sympathy in this bereavement.

The adoption of this report by a unanimous vote of the Board was followed by a few words from Professors Gildersleeve, Griffin, Smith and Wilson. All united in bearing witness to Dr. Sutphen's brilliancy and promise as a scholar and to the strength and sweetness of his character as a man.

Mr. Frank Jewett Mather, Jr., who received the degree of Doctor of Philosophy from the Johns Hopkins in 1892, and is now Assistant Editor of the *New York Evening Post*, has established a fund to perpetuate in this University the memory of his life-long friend. This most generous and appropriate memorial of Dr. Sutphen's life and services is to be known as the Morris C. Sutphen Memorial Fund, and the income of it will be devoted to the purchase of books for the Classical Library.

NOTES FROM THE BIOLOGICAL LABORATORY.

SOME POINTS IN THE STRUCTURE AND DEVELOPMENT OF MELLITA TESTUDINATA.

By CASWELL GRAVE, Ph. D.,
Assistant in Zoology in the Johns Hopkins University.

This partial account of the structure and development of the larva of Mellita testudinata is published at this time because my duties in the university have made it necessary to abandon my former intention of preparing this year for publication a complete account of the development of the larva and its metamorphosis into a form having the structure of the adult.

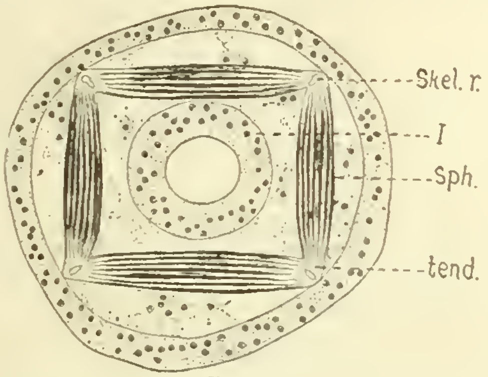

FIG. 1.

Transverse section of fully developed pluteus in plane of sphincter muscles. *Sph.*, sphincter. *I.*, intestine. *Tend.*, tendonous ends of muscles. *Skel. r.*, points where skeletal rods were inserted.

In *Science*, Vol. XV, No. 378, 1902, a short abstract of a paper, prepared for the Chicago meeting of Morphologists, may be found describing the method I have used very successfully in rearing the larvae of Mellita and which has enabled me to obtain a full series of preserved material representing the various stages from the egg to the adult form.

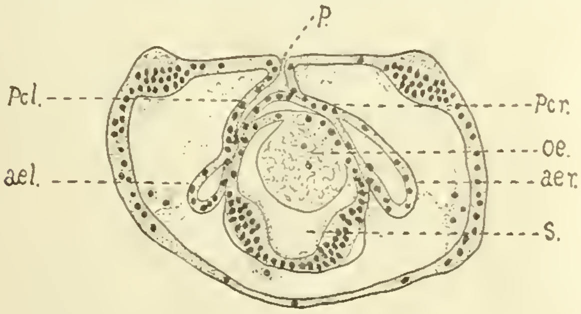

FIG. 2.

Transverse section of pluteus in plane of dorsal pore. *P.*, dorsal pore. *Pcr.* and *Pcl.*, right and left pore canals. *aer.* and *ael.*, right and left anterior enterocoeles. *oe.*, oesophagus. *S.*, stomach. *rpa.* and *lpa.*, posterior arms of the pluteus.

The larvae were reared and preserved during the Summers of 1900 and 1901, in the U. S. Fish Commission Laboratory at Beaufort, N. C., while the detailed study of the material has been carried on in the Zoological Laboratory at the Johns Hopkins University.

A Muscular Apparatus of the Pluteus.

When the plutei were swimming undisturbed in an aquarium it was noticed that the four long posterior arms which join the body of the larva near its middle, would occasionally be quickly spread far apart at the top then more slowly resume their normal position. When confined under a cover glass the plutei exhibited the same motions with much greater frequency than when free, which may indicate that the motion may serve the larva as a means of escape when caught. The movements seem, however, to have mainly to do with the removal of the faeces from the intestine. Passing through the middle of each of the four long posterior arms of the pluteus and ending in the body near the posterior end of the latter is a calcareous supporting rod. Near the middle of the body these four rods come into relation with each other by means of cross rods. The cross rods are not

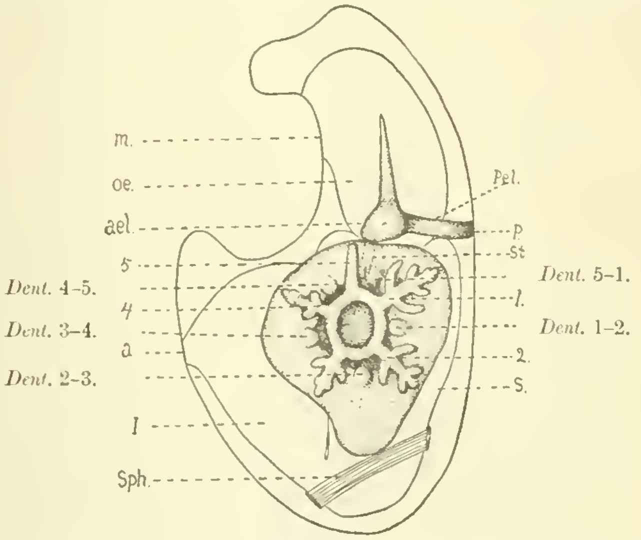

FIG. 3.

A reconstruction of the structures found on the left side of a young pluteus. (The ectodermic pouch is omitted). *M.*, mouth. *oe.*, oesophagus of pluteus. *S.*, stomach. *I.*, intestine. *Sph.*, sphincter. *ael.*, left anterior enterocoele. *Pcl.*, left pore canal. *P.*, dorsal pore. *St.*, stone canal. 1, 2, 3, 4, and 5, radial water canals. *he.*, hypogastric enterocoele. *Dent.*, 1-2, 2-3, 3-4, 4-5, and 5-1, pouches from the hypogastric coelom for the formation of the dentary apparatus.

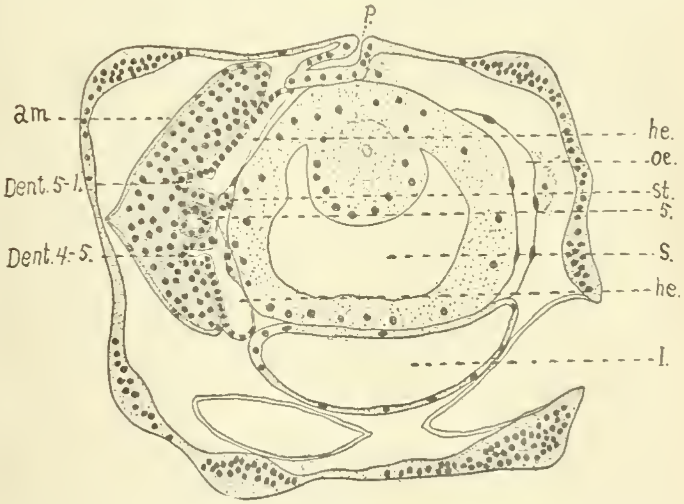

FIG. 4.

Transverse section of a young pluteus (in same stage as in Fig. 3), in plane of dorsal pore. *am.*, amnion. Otherwise the lettering is the same in this figure and the following as for Fig. 3.

fused each with each but at the places in which they meet there is developed an interlacing latticework. In the posterior end of the body of the larva the ends of adjacent skeletal rods are connected by well developed muscles. These together form a rectangular sphincter. Figs. 1 and 3. *Sph.* The muscle tissue does not extend entirely to the calcareous rod but between muscle and rod there is developed a substance which in section has the appearance of tendonous tissue. Fig. 1. *Tend.* Enclosed between the posterior ends of the skeletal rods and the sphincter muscles is the stomach and intestine. When the sphincters contract and the posterior ends of the rods are brought together the alimentary tract is much compressed. The pressure closes the opening of the stomach into the intestine thus preventing the escape of the undigested food, but the contents of the intestine is, in part, forced out at the anal opening. The cross bars connecting the skeletal rods of the arms act as hinges during the contraction of the sphincter and while the posterior ends are brought together the ends of the arms are thrown far apart. Although the muscle fibres of the sphincters are much more highly specialized than the tissue of an ordinary neuromuscular apparatus I have looked in vain for nerve fibres which might supply them. Connected with the musculature of the oesophagus, which in the pluteus of Mellita is also very highly specialized, there are certain definitely located spindle-shaped cells which may possibly be nervous in character.

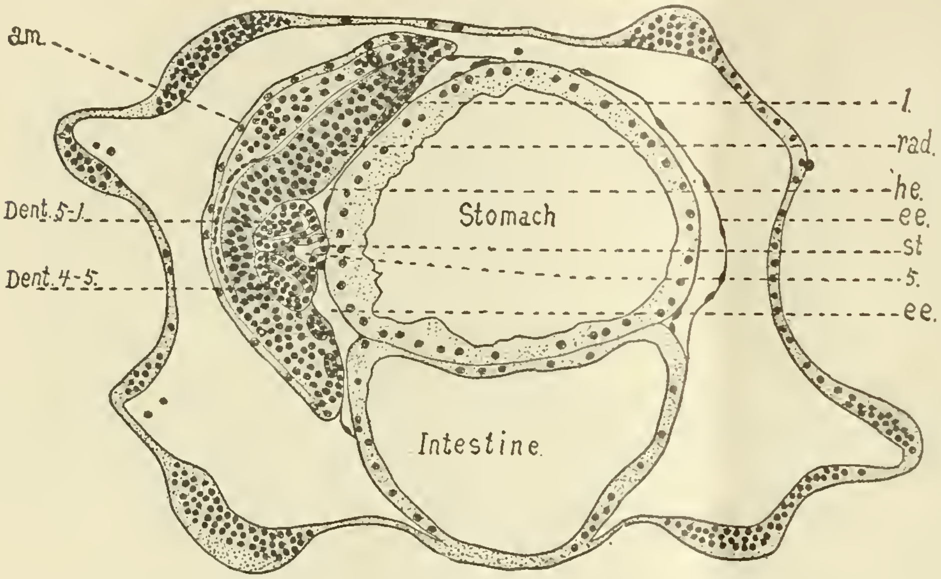

Fig. 5.

Transverse section of a fully developed pluteus in a plane almost the same as that in Fig. 4.

The fibres of the sphincter muscles are developed from mesenchyme cells.

Pore Canals.

There are occasional references throughout the literature of the embryology of the echinoderms to larvae which showed the presence of two pore canals instead of one. By some investigators the canal found on the right side of the larva has been accounted for as an abnormal structure the development of which has been caused by unnatural conditions, by others it is regarded as having a phylogenetic significance. In the larva of Mellita two pore canals are of constant occurrence. Fig. 2 is a section of a Mellita pluteus in the plane of the dorsal pore. Communicating with the single median dorsal pore two well developed canals are seen one joining the left, the other joining the right anterior enterocoele. The right canal is usually slightly smaller than the left but it is never entirely wanting. It persists in the adult as a small closed vesicle in the region of the ampulla which receives the internal opening, or openings, of the madreporite and the terminal opening of the stone canal.

The Dentary Apparatus of the Adult (Aristotle's Lantern).

In his "Etudes morphologique sur les Echinoderms," published in the *Archiv de Biologie*, tome 11, 1891, L. Cuenot suggested (pp. 394–5) that the study of the development of a sea-urchin would probably show that the peripharyngeal chamber (lantern membrane) and its appendages originate from the general coelom and that they represent wholly or at least in part the oral cavity of star-fishes and ophiurids. I find that not only is the peripharyngeal chamber derived from the coelom but also the entire dentary apparatus which is enclosed within it. The lantern and its enclosing membrane are not however homologous with the *oral cavity* of star-fishes and ophiurids but with the *outer perihaemal ring* of Ludwig. The oral cavity, it will be recalled, is the same as the *inner* perihaemal ring of Ludwig and lies immediately internal to the outer perihaemal ring. In star-fishes the development of the perihaemal system has been followed by both McBride and Goto and it has been shown by them to arise as evaginate diverticula of the body coelom. In the formation of the *outer* perihaemal system there are five diverticula concerned, four of which are outgrowths from the hypogastric coelom, and one, in the interradius marked by the stone canal, from the left anterior enterocoele. These diverticula push their way between the radial water canals just outside the water ring and, when cut off from the general coelomic cavities, insert themselves between the water vascular and nervous systems. In the formation of the *inner* perihaemal ring a single diverticulum is concerned, the origin of which is from the left anterior coelom of the larva.

In an ophiurid I have found the *outer* perihaemal system to arise in a manner which shows that it bears a strict homology to the structure of the same name in star-fishes. As in star-fishes five diverticula of the coelom take part in its formation, four from the hypogastric and one from the left anterior enterocoele.

In a sea-urchin, as will be seen from the following account, a similar process to the above is carried out in the development of the lantern and the lantern membrane. One important difference is to be noted however which shows that a *strict* homology cannot be maintained between the outer perihaemal system of star-fishes and ophiurids and the dentary apparatus of sea-urchins. In the first, both hypogastric coelom and anterior enterocoele take part in the formation of the outer perihaemal sinuses while in the development of the dentary apparatus of Mellita each of the five diverticula take their origin from the hypogastric.

The first appearance of the lantern in the Mellita pluteus is to be found in the stage immediately following that in which the hydrocoele buds out from the posterior end of the left anterior enterocoele. In this stage the hydrocoele has just developed its ring and radial canals and has taken up its definite position at the left side of the larval stomach. Over and outside the hydrocoele and closely applied to it, is the invaginated sac of ectoderm and beneath it, also closely applied to it, lies the hollow disc-shaped hypogastric coelom (the left posterior coelom of the pluteus). Just outside the water ring and into each of the five angles formed between the radial canals a small tubular pouch of the hypogastric coelom pokes up. These force their way into the tissue of the sac of ectoderm or (echinoid disc) just internal to the region from which the nerve ring will be developed.

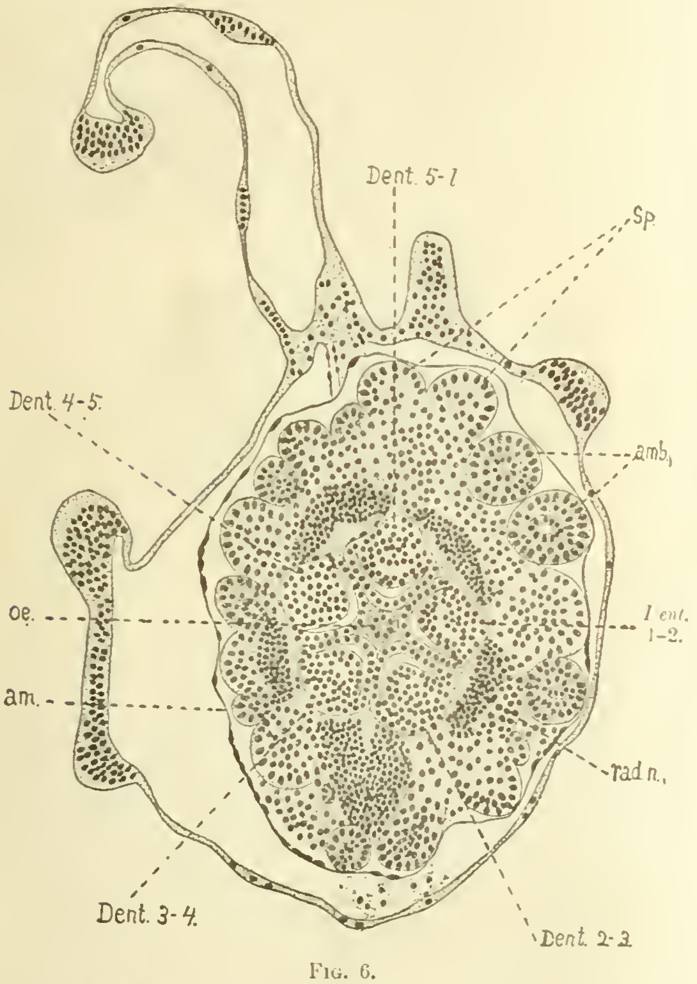

Fig. 6.

Longitudinal section of a pluteus in the same stage of development as in Fig. 5. The plane of the section passes perpendicularly to the oesophagus of the sea-urchin. *Sp.*, spines. *amb.*, ambulacral tentacles. *rad. n.*, radial nerves.

Fig. 3. is a reconstruction of the organs of the left side of a pluteus in this stage. In order that the coelomic pouches may be seen the pouch of ectoderm is omitted. A transverse section of such a pluteus, taken in the plane of the dorsal pore, is shown in Fig. 4. Two of the lantern pouches are thus cut and their continuity with the hypogastric coelom is seen.

In a pluteus which has attained its full size and development these pouches, it will be seen, have lost their connection with the hypogastric coelom and lie with their edges in contact around the developing definitive oesophagus. Fig. 5. is a transverse section of a fully developed pluteus taken in about the same plane as that which is shown in Fig. 4. Fig. 6. is a longitudinal section of a fully developed pluteus taken in a plane which passes through the developing sand dollar perpendicular to its oesophagus and just internal to the nerve ring. It will be seen from these last two figures that while no change in character has taken place in that part of the wall of the pouches which is turned nearest the oesophagus, the outer part of the wall of each has undergone a considerable thickening. It is in these thickened parts of the coelomic sacs that the teeth and ossicles of the lantern are formed.

INCREASE OF MESENTERIES IN MADREPORA BEYOND THE PROTOCNEMIC STAGE.

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In the *Johns Hopkins University Circulars* (1900), I refer briefly to the discovery that in the genus *Porites* the mesenteries beyond the primary six pairs (protocnemes) are added in bilateral pairs, within the entocoele of either the dorsal or ventral pair of directives. This method of mesenterial increase is shown to differ from that characteristic of recent corals generally. The results are also briefly contrasted with the method of mesenterial increase occurring in the three great divisions of the Actiniaria—Hexactiniae, Zoantheae, and Ceriantheae. The close resemblance of the polyps of *Madrepora*[1] to those of *Porites*, with regard to the number and arrangement of the tentacles and mesenteries, suggested that perhaps a similar mode of mesenterial addition might be followed in that genus also, and the present investigation was undertaken to determine this.

In West Indian waters at least three well-known types of *Madrepora* colonies are recognized: *M. palmata*, *M. cervicornis*, and *M. prolifera*. The late Geo. Brook (1893) regarded all these as but *formae* or varieties of one species; Gregory (1895, 1900) at first accepted Brook's suggestion, but, following upon a visit to the West Indies, reverted to the Lamarckian arrangement of the specific distinctness of the three; Vaughan (1901) follows Brook in considering them as only varieties of one species; Verrill (1901) agrees with Brook and Vaughan. So far as my own observations upon the living polyps extend, and upon their anatomy and histology, there are no differences of importance among t three types of growth, and a discussion of their specific recognition or otherwise becomes restricted to the peculiarities of form assumed by the skeleton.

The radial polyps of all the West Indian *Madreporae* are characterized by the presence of only twelve tentacles, six entocoelic and six exocoelic, forming a single cycle, and usually varying in size in such a manner as to suggest larval relationships. On almost any colony, whether of the arborescent or palmate type of growth, polyps are occasionally met with which are slightly larger than the others, and bear tentacles beyond the usual twelve, any even number from sixteen to twenty-four being represented. As the number of tentacles on any polyp is an indication of the number of internal mesenteries, it was to the polyps possessing more than twelve tentacles that attention was directed.

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[1] Since the paper was written I have received Mr. T. Wayland Vaughan's reports, "Some Fossil Corals from the Elevated Reefs of Curaçao, Arube and Bonaire," and "The Stony Corals of the Porto Rican Waters," 1901. Following Brook, 1893, Vaughan points out that none of the species at present called *Madrepora* were included within this genus by Linnaeus in 1758, and that therefore the name cannot be retained for the forms embraced by Dana, Milne Edwards and Haime, and later authors. Vaughan suggests its replacement by *Isopora*, a term first employed by Studer in 1878, in a sub-generic sense. More recently, Prof. A. E. Verrill, 1901, has come to the conclusion that the *Acropora* of Oken, 1815, has much better claims for adoption in place of *Madrepora*.

To procure these for microscopic examination involved considerable labor and care. The polyps of *Madrepora* are so small that the tentacles can only be counted with the assistance of a lens, and then only when in an expanded condition. Among a hundred polyps perhaps only one would display more than twelve tentacles, and on some colonies, especially those living near the surface, no such examples whatever would be found. By carefully chipping around the desired individual it could be isolated on a fragment of the colony of suitable size for study. The polyps were killed in corrosive-acetic or in formol, afterwards transferred to alcohol, then slowly decalcified with hydrochloric acid, and stained and sectionized.

The radial polyps and corallites of *Madrepora* are as a rule oval in section, the axial-abaxial diameter being the longer (Fig. 1). The polyps with from sixteen to twenty or more tentacles were still more elongated, but with the longer diameter at right angles to the axial-abaxial plane (Fig. 7), the tentacles still forming a single uninterrupted cycle all the way round. Two oral apertures were present on the disc of upwards of thirty enlarged examples found; in only one or two doubtful instances was but one mouth remaining. Evidently therefore the increase of tentacles and mesenteries early results in oral fission, if the two, indeed, do not proceed *pari passu*. The plane of fission coincides with the median or axial-abaxial plane, and in some rare instances the two polypal halves appeared to be in process of separation by the ingrowth of the middle tentacles and septa. Increase in the number of polyps in any colony of *Madrepora* by means of fission must however be very insignificant compared with the usual increase by coenosarcal gemmation.

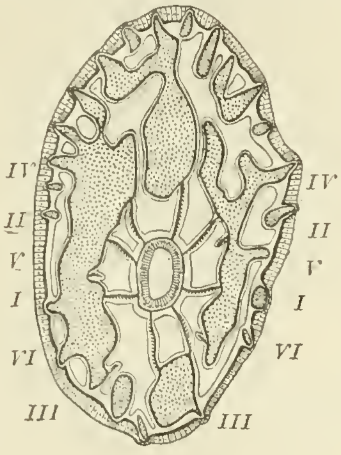

FIG. 1.

Transverse section through the stomodaeal region of a projecting radial polyp of *Madrepora*. In relation to the axis of the branch the lower aspect of the section is axial and the upper is abaxial. The two mesenteries, *IV*, *IV*, forming a bilateral pair, are the dorsal directives, and mesenteries, *III*, *III*, are the ventral directives. Mesenteries, *II*, *V*, and *I*, *VI*, on each side constitute two anisocnemic unilateral pairs. The polypal cavity is in communication with the superficial canals by means of several radiating canals. The outer polypal wall (coenosarc) is supported upon twenty-four costal ridges.

In this and all the figures the three coelenterate layers are represented as follows: The *ectoderm* by the conventional columnar epithelium, the *mesogloea* by a thick black line, and the *endoderm* as a clear layer. Owing to its narrowness the calicoblastic ectoderm is unrepresented, the skeletotrophic mesogloea appearing to cover the corallum directly. The skeleton or corallum is indicated by the dotted areas.

The early stage at which oral fission is accomplished in the larger polyps of *Madrepora* is in marked contrast with the same phenomenon in *Porites*.[1] For in numerous examples of the latter with tentacles and mesenteries in excess of twelve, often from twenty to twenty-four, I have only come upon one or two instances in which two oral apertures were displayed on a single disc. The problem of mesenterial increase in polyps of *Madrepora* is therefore more complex than in *Porites*, for from the beginning the new mesenteries in *Madrepora* are associated with two stomodaeal tubes instead of only one.

A transverse section of an ordinary radial polyp of *Madrepora*, through the stomodaeal region, is represented in Fig. 1. Attention will be directed only to the mesenteries. Twelve of these are present, arranged in six bilateral pairs, of which two pairs, *III*, *IV*, situated at opposite extremities, are directives, and two pairs, *V*, *VI*, are incomplete, that is, are not attached to the stomodaeum. The retractor muscles are sufficiently well developed on mesogloeal plaitings to admit of the paired arrangement of the mesenteries being established. In the figures the mesenteries are numbered I to VI, in accordance with the order in which the pairs are usually found to appear in the course of embryonic and larval development of both corals and anemones. Throughout their course the fifth and sixth mesenterial pairs never become inserted on the stomodaeum, but disappear shortly below the lower termination of the stomodaeum, and never bear mesenterial filaments. In Actinological literature the remaining eight complete mesenteries are known as the Edwardsian mesenteries; and the polyps of *Madrepora*, like those of *Porites*, are said to retain in the adult condition the Edwardsia-stage of mesenterial development, a stage passed through in the growth of most Madreporaria and Actiniaria.

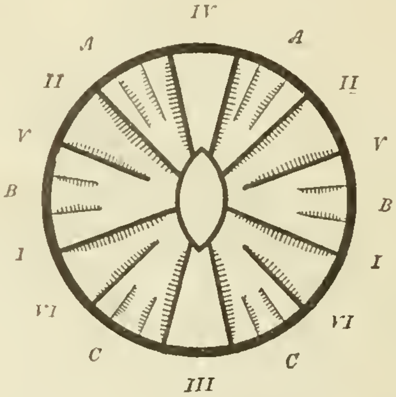

FIG. 2.

Diagram representing the order of appearance of the second cycle of mesenteries in most modern corals. The primary mesenteries, *I–VI*, are in the same condition as in the adult polyps of *Madrepora*, except that the fifth and sixth pairs are nearly united with the stomodaeum. Within each of the six primary exocoeles a new pair of mesenteries, *A–C*, has appeared, the sequence being represented by the comparative sizes of the mesenteries from the dorso-lateral to the ventro-lateral exocoeles. Later, all the primary mesenteries become inserted on the stomodaeum and the second cycle pairs are equal. Afterwards the third cycle mesenteries arise successively in unilateral pairs within the exocoeles between the pairs of the first and second cycles, first on one aspect of the second cycle mesenteries and then on the other aspect, and afterwards become equal in size. Thus several possible regions of growth occur within each primary exocoele, each capable of giving rise to an isocnemic mesenterial pair.

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[1] In the course of my former investigations on the order of mesenterial increase in *Porites*, 1900, no evidence was presented that the additions in the end resulted in polypal fission. From an examination of material collected later, it appears that when six new pairs of mesenteries have been formed the enlarged polyp, now possessing twenty-four mesenteries, may undergo division into equal halves, at any rate so far as concerns the oral aperture, stomodaeum, and mesenteries. The mesenteries in each daughter polyp are arranged exactly as in ordinary polyps arising as buds. The introduction of fission however in no way modifies the morphological significance of the pinnate order in which the increase of mesenteries takes place.

Nearly all Madreporarian polyps pass beyond the stage with only twelve mesenteries, usually by the addition of alternating isocnemic pairs within the six primary exocoeles, which in the end constitute one or more distinct cycles. While this is taking place the fifth and sixth primary pairs as a rule become complete. As already mentioned *Porites* among corals is characterized by the mesenteries beyond the protocnemic stage being added in bilateral pairs, disposed pinnately within either the dorsal or ventral entocoeles. Further, the incomplete fifth and sixth pairs never become united with the stomodaeum. Figs. 2 and 3, with their explanations, will make these differences clear.

Over a score of the large polyps of *Madrepora* were sectionized transversely. All possessed more than twelve mesenteries, and two stomodaeal tubes, divided all the way, were already present; but as regards the mesenterial increase, practically only three different stages are represented, in each of which twenty-four mesenteries already occur at one phase or another of their establishment. The three conditions are represented in Figs. 4–6, from camera lucida drawings of actual sections.

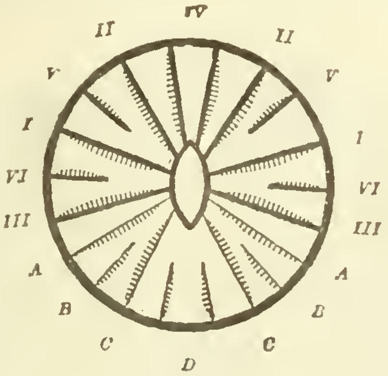

Fig. 3.

Diagrammatic arrangement of the mesenteries in a polyp of *Porites*, showing the manner of increase of the mesenteries beyond the six primary pairs. These latter are indicated by the thicker radial lines, and numbered *I–VI*. Four new bilateral pairs, *A–D*, have been successively added at one region within the entocoele of the ventral directives, *III, III*, the latter having become pushed far apart (cp. Fig. 6). In some polyps of *Porites* the new mesenteries are added within the dorsal directive entocoele instead of the ventral.

The earliest stage obtained is that represented in Fig. 4. Twelve complete mesenteries are present, and eight incomplete members, all attached to the inner boundary-wall of the polyp. From the disposition of the musculature and the relation of the complete to the incomplete members there is no difficulty in ascertaining which are the primary twelve mesenteries. They are indicated by the same numerals as in the simple polyp. Ventrally they have become widely separated from the dorso-ventral plane which passes through the entocoele of both pairs of directives, but in a symmetrical manner, so that six are on one side and the corresponding six on the other. As yet additional mesenteries are found only on the ventral (axial) side of the polyp, situated within the directive entocoele (*III, III*). They consist of two bilateral pairs of complete mesenteries and two incomplete pairs, *A–D*, the lettering not necessarily possessing any significance as to the order in which the mesenteries appeared. Each member of the new outermost complete pair (*A*) forms with the primary complete directive mesentery adjacent to it (*III*) a new pair of directives, the musculature being on the faces of the mesenteries turned away from one another; the next incomplete and adjacent complete new mesenteries on each side form a unilateral anisocnemic pair (*B, C*), in which the musculature is on the faces turned toward each other, as in pairs *I* and *VI* of the simple polyp. The two members of the middle bilateral pair (*D, D*) of incomplete new mesenteries have as yet no corresponding complete mesenteries wherewith to constitute a unilateral pair. The primary dorsal (abaxial) directives (*IV, IV*), are somewhat widely separated, but no new mesenteries are intercalated between them.

With the exception of the presence of two stomodaeal tubes instead of only one, the disposition of the new mesenteries so far exactly resembles the stage in the mesenterial increase in *Porites* represented in Fig. 3.

Special importance attaches to the two mesentery-like strands which connect the two stomodaeal tubes. Sometimes they are short, as in the section represented, or they may be much longer, the stomodaea then being widely apart. For a long time their significance was difficult to understand, and it was only from a study of the early stages in ordinary budding in *Madrepora* that a satisfactory solution of their presence was reached. Full consideration of them will be deferred until later. In the meantime it will be noticed that eight mesenterial insertions—four primary and four new—are associated with each stomodaeum, which is the number characteristic of an ordinary adult polyp; also that four incomplete mesenteries belong to each polypal half. Thus, regarding each of the mesentery-like strands as representing two mesenteries, the full complement of twelve mesenteries is associated with each stomodaeum, as if the latter were separate polyps.

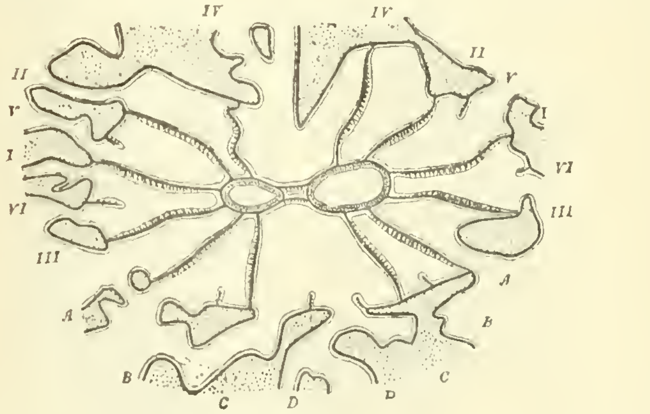

Fig. 4.

Transverse section through the stomodaeal region of an enlarged polyp, wholly retracted within the corallum. The stomodaeum is divided into two tubes which are connected by two mesentery-like strands. Four pairs of new mesenteries, *A–D*, are present in addition to the six pairs in simple polyps.

Fig. 5 displays a further stage in the mesenterial development. There are now seven complete mesenteries extending from each stomodaeum to the body-wall, and only a single connecting strand. Evidently the two additional complete mesenteries (*E, E*) represent the dorsal member of the two connecting mesenteries in the previous figure. They now form a new bilateral pair situated at the upper aspect of the polyp, that is, within the entocoele of the dorsal directives (*IV, IV*), and the musculature is so disposed that the mesentery to the left constitutes a pair of directives with the primary directive mesentery on that side, and likewise with the two on the right side (*IV, E*). New mesenteries thus occur at the two axial extremities of the polyp, within both the dorsal and the ventral entocoeles, and each stomodaeum has associated with it a dorsal and a ventral pair of directives, as in ordinary adult polyps.

Fig. 6 represents the final stage. Eight mesenteries now stretch from each stomodaeum to the body-wall, and the two tubes are wholly disconnected. The two additional mesenteries (*F, F*) are disposed within the entocoele of the dorsal pair of mesenteries (*E, E*) shown to be added in the previous figure, and the retractor muscle is arranged on the faces turned towards each other, so that each mesentery will form an isocnemic pair with the corresponding incomplete mesentery (*D*) on the ventral aspect, a pair comparable with the mesenteries *II* and *V* of the simple polyp. The mesenterial system associated with each stomodaeum is now constituted exactly as if each represented a distinct polyp (cp. Fig. 1).

The three sections from separate polyps clearly demonstrate that in *Madrepora* new mesenteries beyond the protocnemes are added in bilateral pairs within the primary entocoele of the dorsal directives and also of the ventral directives. For the disposition of the musculature and the relation of the complete and incomplete members leave no doubt that the mesenteries numbered *I* to *VI*, on each side are really the protocnemes of the original polyp, and therefore the four bilateral pairs (*A–D*)—two complete and two incomplete—on the ventral aspect are new pairs which have been added within the entocoele of the primary ventral directives, now pushed widely apart; and similarly with the two bilateral pairs (*E, F*) on the dorsal aspect within the primary entocoele of the dorsal directives.

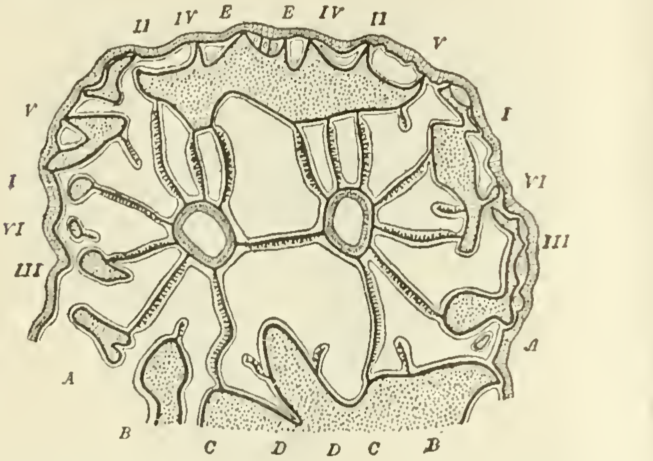

Fig. 5.

Transverse section through the stomodaeal region of another enlarged polyp, with the dorsal and lateral areas free. Only a single mesenterial strand connects the stomodaeal tubes. New mesenteries, *A–D*, have been added within the ventral entocoele and one pair, *E, E*, within the dorsal entocoele.

The accompaniment of fission of the stomodaeal tube, involving a separation of the mesenteries attached to it into two series, has really no bearing upon the manner of mesenterial succession which alone is sought to be established. I have already carried out investigations on mesenterial development and stomodaeal fission in the West Indian corals, *Manicina areolata* (Linn.), *Favia fragum* (Esper), and *Maeandrina labyrinthica* (Ell. and Sol.), etc., but from the beginning the metacnemes in these are added in unilateral exocoelic pairs, as already described for the majority of actinians and corals (Fig. 3), and the introduction of fission in no way modifies this method. Fission commences in young polyps of *M. areolata* and *F. fragum* after the third or fourth mesenterial cycle has become established. No new pairs of directives arise in the fission polyps, and the plane of division is not through the directive entocoeles as in *Madrepora*, but is usually at right angles to the directive plane.

During the growth of the second cycle of mesenteries in most corals and actinians the fifth and sixth developmental pairs of protocnemes become complete, but this never happens in the enlarged polyps of *Madrepora* nor of *Porites*; the new pairs are also anisocnemic, with the exception of those constituting directives.

The sequence represented in the three figures is that characteristic of all the polyps examined, but variations in the number of the mesenteries which may be relegated to either the dorsal or ventral extremity have been met with. Fig. 7 represents a section through a polyp in which three additional pairs (*C–E*)—two complete and one incomplete—are already added dorsally, and only two pairs (*A, B*)—one complete and one incomplete—ventrally. In all the examples previously considered no more than two new pairs are placed dorsally, the remaining four being ventral. The connecting pair in Fig. 7, whether in the end attached dorsally or ventrally, will separate the two members of a bilateral pair of incomplete mesenteries. From the arrangement of the musculature, and the relationships of the complete and incomplete mesenteries, it is clear that each polyp will, upon separation along the axial plane, possess twelve mesenteries with the paired arrangement exactly as in the adult.

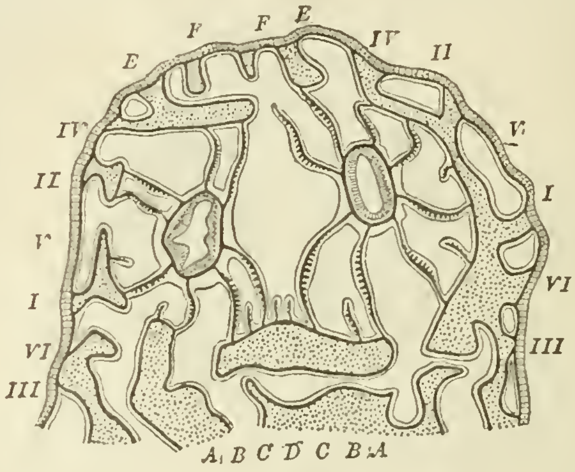

Fig. 6.

Transverse section through a third polyp in which the two stomodaeal tubes are altogether distinct from one another. Four pairs of mesenteries, *A–D*, have been added within the ventral entocoele, and two pairs *E, F*, within the dorsal entocoele.

Another polyp exhibited thirteen complete mesenteries, with several alternating incomplete members, associated with one stomodaeum, while on the other stomodaeum were inserted the normal eight. Several large ova were developed in the single connecting mesentery of one polyp, while they were absent from the remaining mesenteries.

We may now return to a consideration of the median mesenterial strands connecting the two stomodaeal invaginations. In some polyps two of these are found to extend as vertical partitions throughout the length of each stomodaeum, and at the uppermost extremity of the polyp they pass along the narrow central portion of the disc intervening between the two oral apertures. Sometimes only one may be present, extending the whole way; in others the partition has disappeared above, but is complete below;

while again, as in Fig. 6, both partitions may be wholly absent, each presumably represented by the two distinct pairs of mesenteries (*E, E*; *F, F*) which stretch from the stomodaeum to the dorsal region of the body-wall.

That each connecting strand actually becomes divided into two mesenteries, and that these effect a union with the vertical body-wall, is clearly shown in the series of partly diagrammatic transverse sections, Fig. 8 (*A-D*), taken at different levels from a single polyp. Fig. *A* is from a section through the lower stomodaeal region, where only a single straight mesentery joins the two stomodaeal tubes. The dorsal connecting mesentery is already divided, and presumably is represented by the two mesenteries, *e, e* (cp. Fig. 5). In Fig. *B*, taken from a section a little higher, the connecting mesentery is directed in an angular manner toward the dorsal part of the body-wall, and in the next it is actually inserted on the wall; while in the last figure (*D*), from a section near the upper extremity of the polyp, the two halves are altogether apart, and appear as two distinct mesenteries, *f, f*. The musculature is strongly developed throughout, whether the mesentery be simple or divided.

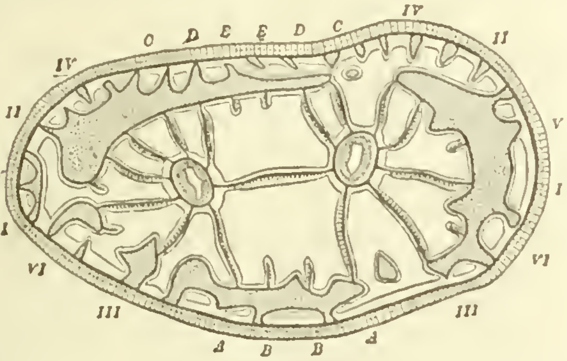

Fig. 7.

Transverse section through a large polyp projecting all the way round from the general surface of the colony. Only two mesenterial pairs, *A*, *B*, occur within the ventral entocoele, while three pairs, *C-E*, have been added within the dorsal entocoele.

From the series of sections it appears that the two connecting mesenteries, which originally pass straight across the portion of the disc intervening between the two oral apertures, first begin to extend from their middle towards the periphery of the disc, and when that is reached each half becomes distinct. The separation then proceeds down the polypal-wall, until ultimately the partition is divided throughout, and two mesenteries, each connected with its own stomodaeum from the beginning, are now fully established, and in all respects resemble the older complete mesenteries.

The new incomplete mesenteries have a much simpler origin. They are never connected with the stomodaeum, but in serial transverse sections can be seen to arise somewhere towards the upper extremity of the polypal wall, and to extend vertically, as well as radiately, for but a short distance. In no case do they pass downwards as far as the incomplete members of the primary series. In one or two instances I have failed to discover them. The incomplete mesenteries never bear filaments, but the complete mesenteries are all filamentiferous for some distance below the inner termination of the stomodaeum. The connecting mesenteries, while still unattached to the column wall, also bear filaments at their free edge.

A knowledge of the early stages of gemmation in ordinary polyps of *Madrepora* assists towards an understanding of the peculiar relationships of the mesenteries during the process of fission. Figs. 9–13 represent a series of sections through a very young polyp from near the apex of a branch of *M. prolifera*. The stage is so early that no tentacles have yet appeared. The bud is formed wholly from the superficial covering of the colony, over one of the ordinary peripheral canals, and structurally is entirely unconnected with the older polyps, though in communication with them by means of the canal system. The sections are vertical, and are taken from only one side of the polyp, but an exactly similar series is found to occur on the other half.

Fig. 9 is from a section passing through the oral aperture, which has just been formed. The stomodaeal walls appear as simple inturnings of the superficial wall of the colony. The section is in the directive plane passing through the two directives entocoeles, so that no trace of the mesenteries is included. The two slight elevations of the outer wall are probably the first indications of the axial entocoelic tentacles. The endodermal epithelium of the bud, including that forming both the inner and outer lining of the stomodaeum, differs altogether from that elsewhere lining the canals and gastric cavity of the polyps; the cells are columnar, strongly ciliated, non-vacuolated, and stain deeply.

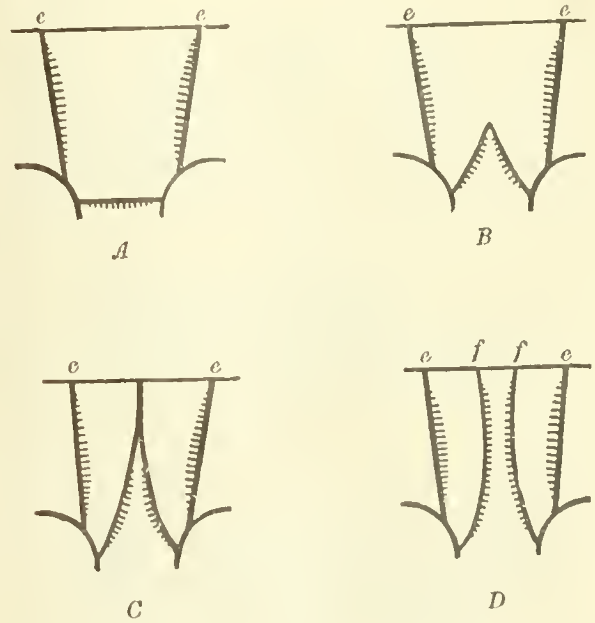

Fig. 8.

Diagrammatic figures taken at different levels from a single polyp to illustrate the manner in which a single mesenterial strand joining two stomodaeal tubes becomes inserted on the polypal wall as a pair of distinct mesenteries: *A* is towards the inner termination of the stomodaeum, *D* is from the upper extremity of the polyp, and *B* and *C* from intermediate sections.

Fig. 10 is from a section a little to one side of the oral aperture, and reveals four mesenteries extending vertically from the outer wall as far as the inturned stomodaeal wall. In Fig. 11 the two outermost mesenteries have become free at their lower extremity, but the two inner still retain their connection with the infolded margin of the stomodaeum. In the next figure all the primary mesenteries are free from the stomodaeum, but the one to the right is connected with the inner wall of the peripheral canal. To the left of the mesentery the rudiment of an additional mesentery has now appeared. In the succeeding figure

(Fig. 13) the mesentery at the extreme right has disappeared, and a rudiment of a second new mesentery occurs. Thus all the six mesenteries—four complete and two incomplete—of one side of an adult polyp of *Madrepora* are accounted for.

The important facts in the present connection which the series of sections serve to demonstrate are as follows:—1. In the formation of a bud of *Madrepora* the six pairs of mesenteries characteristic of the adult polyps are all present at a very early stage, perhaps appearing simultaneously. 2. The four complete pairs arise at or near the angle between the disc and stomodaeal wall, and extend all the way down the latter, and also radiate along the outer wall. 3. The two incomplete pairs arise on the body-wall (not yet differentiated into actual disc and column) some distance from the oral aperture, and from the beginning are wholly free from the stomodaeum, and extend only a short distance.

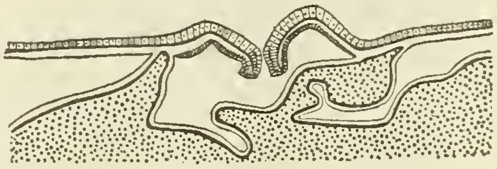

Fig. 9.

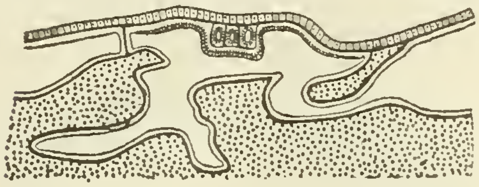

Fig. 10.

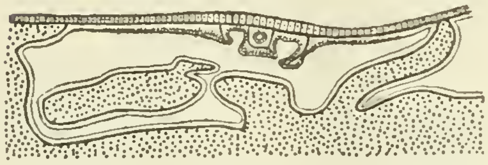

Fig. 11.

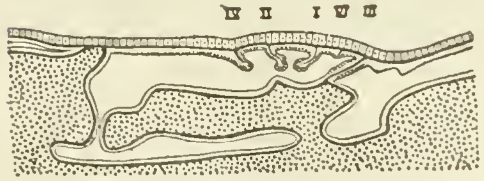

Fig. 12.

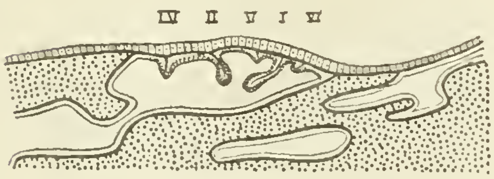

Fig. 13.

Figs. 9–13.

Series of sections illustrating the early stages in the formation of a bud polyp of *Madrepora.*

The above results from the bud polyps may now be compared with the conditions occurring in the fission polyps of *Madrepora.* That no succession in the appearance of the new six pairs of mesenteries has been met with in the numerous fission polyps examined is evidently due to the circumstance that, as in the bud, all the six pairs appear at a very early stage, if not simultaneously. The presence of mesenterial strands connecting the two stomodaeal tubes may be brought about by the close association of the complete mesenteries with each stomodaeum at the time of separation of the latter. Obviously from the insertion of the mesenteries at about equal distances all round the stomodaeal wall only two adjacent members will be directly opposite each other, and, arising from the same proliferating band of tissue, may grow as single lamellae down the opposite aspect of each stomodaeal wall; and thus for a time remain as partitions uniting the two stomodaeal tubes. It is only later, when each single partition begins to extend radiately across the disc and passes down the body-wall, that each strand becomes two distinct mesenteries, and the mesenterial system for each polyp is normally established. The early appearance of the incomplete mesenteries, and their perfect freedom from the stomodaeum in the fission polyps, are features likewise reproduced in the young bud polyps.

It has already been mentioned that the number of tentacles on the larger polyps may vary from sixteen to twenty-four, indicating that the passage from the twelve tentacle stage to the stage with twenty-four is not abrupt. That such a succession should characterize the appearance of the tentacles, though not of the mesenteries, can be easily understood. In the development of corals and anemones it is found that, as a rule, the number of tentacles corresponds with the number of mesenterial chambers, the appearance of new tentacles following very closely upon the formation of additional mesenterial chambers. In the earliest stage of mesenterial addition in *Madrepora* (Fig. 4) only eighteen mesenterial chambers are fully established, neglecting the two axial chambers where additions are taking place; thus there would be only as many tentacles. Fig. 5 possesses two additional peripheral mesenteries, hence, two additional mesenterial chambers and tentacles. When all the mesenteries are connected peripherally twenty-four mesenterial chambers will be present, affording the possibility of twenty-four tentacular outgrowths.

The enquiry may now be made as to how far the metacnemic sequence characteristic of *Porites* and *Madrepora* conforms with what is already known of the mesenterial development of the Zoantharia generally. The development and anatomy of most modern corals reveal that the metacnemes are added as unilateral isocnemic pairs within the six primary exocoelic chambers, as in Fig. 2, and the septa follow a corresponding succession. One, two, four, etc., unilateral pairs may arise successively within each primary system, and in the end become arranged in one, two, three, or more cycles. The first cycle of metacnemes consists of six equal pairs, the second of twelve, the third of twenty-four, and so on. The metacnemes unlike the protocnemes exhibit perfect radial symmetry when the members of each cycle are fully developed; the presence of two pairs of directives imparts a bilateral character to the six pairs of primary mesenteries. Departures from the hexameral plan are not infrequent in corals, but apparently no form has been described which introduces a different fundamental type of metacnemic succession. The absence of directives and the irregular mesenteric systems described in certain colonial corals—*Lophophyllia*, *Mussa*, *Euphyllia*, etc., are probably in all cases due to asexual methods of reproduction, and do not indicate the true characteristics such as would be revealed by polyps developed directly from larvae.

Similarly with modern Actinians, exclusive of Zoanthids and Cerianthids. Their metacnemic sequence conforms most closely with that of modern corals. In many the metacnemes, even of the first cycle, are incompletely established (*Edwardsia, Gonactinia, Oractis, Peachia*), but so far as they go they indicate no new type of development. Dr. O. Carlgren (1897) has lately described an Actinian, *Endocoelactis*, the adult characteristics of which seem to show that the second and third cycles of mesenteries have been added in unilateral pairs within the primary entocoeles, the directive entocoeles excepted. The discovery is full of suggestiveness in connection with the entocoelic succession followed in *Porites* and *Madrepora*. Carlgren however is inclined to regard the arrangement as merely an exception to the general plan of Hexactinian development, and places the genus under the sub-tribe Actininae.

The entocoelic growth of mesenteries and septa is also different from anything which has yet been definitely established among fossil corals, including the Rugosa of Palaeozoic times. It must be acknowledged that our acquaintance with the septal succession of extinct corals is very incomplete; a study of numerous types by means of serial sections will be necessary before an adequate knowledge of their method of growth is available. Thanks to the labors of R. Ludwig (1862, 1865) and A. Kunth (1869) we are more or less familiar with the septal plan of a large number of Rugose corals, in so far as this can be determined from the ridges and grooves exhibited on the outer surface of the coralla. According to Ludwig the primary plan in the Rugosa is hexamerous, whereas Kunth assumes a tetrameral condition both for the primary and secondary stages. Both writers find the metasepta to be added successively at four regions, in a manner which finds its expression in what is now known as Kunth's law.

Some of Ludwig's descriptions and figures (Pl. xxvii, Figs. 2), indicate that new septa were added within all the six primary chambers, while some few septal pairs appear to have been added axially, i. e. within an entocoele, as in *Madrepora* and *Porites*. The definite establishment of this is a matter of the highest importance.

Recently (1902), I have been able to confirm the observation of Pourtalès (1871) as to the primary hexameral character of the Rugose coral, *Lophophyllum proliferum* (McChesney), and by means of serial sections have definitely established the metaseptal sequence. The structure of Palaeozoic corals so nearly conforms with that of recent forms as to warrant the assumption that the relationships of the polyp to the corallum were the same as those now thoroughly understood. The metaseptal arrangement in *Lophophyllum* is such as to indicate that the mesenterial additions took place successively at one region only within four of the six primary exocoelic chambers; two of the chambers, are the middle exocoeles, and the other two are the exocoeles on each side of one of the axial (directive) pairs of primary mesenteries; no additions were made in the two remaining primary exocoeles. So far as the septal arrangement in *Lophophyllum* can be taken as representative of the Rugosa generally the order is shown to be most closely related to the living Zoantheae. In this group of mainly tropical and colonial Actinians the metacnemes are added in succession at one region within the primary exocoele on each side of the ventral pair of directives, whereas in the Rugosa they were added in two middle primary exocoeles in addition.

With their entocoelic metacnemes therefore *Porites* and *Madrepora* cannot yet be brought into conformity with either the extinct Rugose corals or the living Zoanthid polyps, seeing that these are characterized by exocoelic additions. In one feature however they all agree. The metacnemes in the Zoantheae and in *Porites* and *Madrepora* arise successively, a bilateral pair more or less simultaneously on opposite sides of the polyp. In the end they are arranged on each side of the polyp so as to constitute unilateral pairs consisting of a complete and an incomplete moiety (anisocnemic), whereas in ordinary Hexactinians the metacnemic unilateral pairs are constituted of equal moieties which appear together (isocnemic).

The Cerianthids present in their mesenterial growth a method which most nearly approaches that under consideration, though differing in several important details. While Actinian writers such as Boveri and McMurrich hold that the first four pairs of mesenteries to arise represent the four Edwardsian mesenteries, van Beneden (1897) considers that no such relationship can be maintained, and the results of Carlgren (1897) upon the arrangement of the musculature would seem to indicate the same, as only one pair of directives are represented. The most important characteristic of the Ceriantheae in the present connection is that the later mesenteries are always developed within the axial entocoele on the asulcar aspect of the polyp, and that the organs in the adult remain as bilateral pairs. Carlgren has shown that the feeble retractor muscles in each mesentery are always on the face turned away from the directives, that is, the mesenteries do not constitute unilateral pairs in which the faces bearing the retractor muscles are vis-a-vis as in all other actinians and corals.

The numerous researches of the late H. de Lacaze-Duthiers and those of G. von Koch have demonstrated that the protoseptal stage of many modern corals is hexameral; I have also established the same for several West Indian species; and a like plan would seem also to have been characteristic of the extinct Rugosa. It is with the appearance of the metasepta that fundamental divergences are introduced. These seem to afford hope that they may serve as a means for arranging the Madreporaria on a more strictly morphological basis than is at present possible. At least three fundamental types are now known: *a*, the cyclical, characteristic of most modern corals; *b*, the bilateral exocoelic, in *Lophophyllum* and probably other Rugosa; *c*, the bilateral entocoelic, now demonstrated for *Porites* and *Madrepora*.

The essential results may be now summarized:—

1. In most of the polyps of the genus *Madrepora* only the six bilateral pairs of primary mesenteries are developed, of which four pairs are complete and two incomplete. On any colony a few enlarged polyps may possess a greater number of mesenteries. The new mesenteries beyond the primary six pairs are added in complete or incomplete bilateral pairs, at only the two axial extremities, the entocoele of the dorsal and ventral directives. The cyclic disposition is never assumed; the directives form isocnemic pairs, but the other pairs are all anisocnemic.

2. The pinnate method of mesenterial increase is distinct from that characteristic of most recent corals; in these the metacnemes are added in isocnemic pairs all round the periphery of the polyp, within the six primary exocoeles, and in the end constitute one or more distinct alternating cycles.

3. The method of mesenterial increase beyond the protocnemic stage occurring in *Madrepora* is also characteristic of the genus *Porites*, except that in any one polyp of *Porites* the new mesenteries are disposed at either the one or the other extremity, not at both.

4. Six new bilateral pairs of mesenteries appear practically simultaneously in *Madrepora*, but only later do they all extend down the polypal pall. In *Porites* the new pairs follow one another in a regular succession.

5. In *Madrepora* the mesenterial increase is early associated with fission of the stomodaeum, and in the end probably with complete polypal fission, in which half the mesenteries of each fission polyp are derived from the primary twelve of the original polyp and the other half are new formations. The resulting paired arrangement of the mesenteries, including the presence of two pairs of directives, is exactly as in primary polyps. Fission of the stomodaeum appears very late in *Porites*, not until after the full establishment of six new pairs of mesenteries.

(*References in No.* 155, *Jan.* 1902.)

PROCEEDINGS OF SOCIETIES.

Scientific Association.

January 23, 1902.

The Prolongation of the Life of the Unfertilized Egg of the Sea Urchin by means of Potassium Cyanide Solution. By W. M. Lewis.

The Dependence of Plants upon Fungi. By D. S. Johnson.

Special Meeting, February 1, 1902.—Tops and the Earth's Motion. By A. G. Webster, of Clark University.

February 27, 1902.—The Intellectual Conditions for Embryological Science. By W. K. Brooks.

March 20, 1902,—With the American Institute of Mining Engineers through Mexico. By W. B. Clark.

Philological Association.

February 20, 1902.—One hundred and ninety-sixth regular meeting. Professor Gildersleeve in the chair. Twenty-six members were present.

Papers read:

On the Co-ordination of the Participle in the Attic Orators. By R. S. Radford.

German Military Terms of the Fifteenth and Sixteenth Centuries. By W. Kurrelmeyer.

March 21.—One hundred and ninety-seventh regular meeting. Professor Gildersleeve in the chair. Forty-six members were present.

Papers read:

The Languages of the Philippine Islands. By F. R. Blake.

Chaucer's Morpheus as the God of Sleep. By R. L. Ramsay.

Historical and Political Science Association.

February 7.

The Rights of Private Property at Sea. By J. G. Whiteley.

Patten's Theory of Prosperity. By Y. Hattori.

February 20.

Reunion in celebration of the twenty-fifth year of the Association.

Sixty-six persons formerly connected with the Historical and Political Seminary were present. Of the 105 surviving Doctors of Philosophy, 32 attended the reunion.

The exercises included a principal paper on The Human Side of the Continental Congress. By Herbert Friedenwald.

Short addresses by: Professor J. F. Jameson, of the University of Chicago; Dr. L. W. Wilhelm, of Baltimore; Professor D. R. Dewey, of the Massachusetts Institute of Technology; Dr. E. M. Hartwell, of the Dept. of Municipal Statistics, Boston.

March 7.

Manumission in the Early Middle Ages. By J. J. Crumley.

Barton's A Sketch of Semitic Origins. By R. Garrett.

Baker's Municipal Engineering and Sanitation. By T. B. Moore.

March 21.

English Monasteries, with illustrations. By J. M. Vincent.

Dunning's Political Theories: Ancient and Mediæval. By J. S. Moore.

Poizat's Les Réforme de Stein et de Hardenberg. By O. P. Chitwood.

Maurtua's Question of the Pacific. By T. J. Stubbs.

Murray's Life in Scotland a Hundred Years Ago. By H. J. Eckenrode.

THE PERCY TURNBULL MEMORIAL LECTURESHIP OF POETRY.

TENTH COURSE, 1902.

Professor EMIL G. HIRSCH, D. D., LL. D.

ON

MEDIÆVAL JEWISH POETRY.

A lectureship to treat of Poetry has been instituted in this University by the generosity of Mr. and Mrs. Lawrence Turnbull, of Baltimore, who thus commemorate the name of their son, Percy Graeme Turnbull, who died in 1887.

In accordance with the terms of the gift, a course of lectures may be expected annually from some one who has gained distinction as a writer of poetry, or as a critical student of the poetic art.

The Trustees have the pleasure of announcing that the tenth course of lectures on this foundation will be given by the Reverend Emil G. Hirsch, D. D., LL.D., Professor of Rabbinical Literature in the University of Chicago, editor of "The Reform Advocate," Chicago, and author of various monographs on Biblical and religious subjects.

The subject of the course will be *Mediæval Jewish Poetry.*

The lectures will be given in McCoy Hall, at 5 o'clock, beginning Tuesday, April 8, 1902.

The lectures will begin punctually and will close within the hour. The door will be closed when the lecturer rises.

Cards of admission will be required, and they may be obtained on application, *by mail*, to the Registrar of the University.

TOPICS.

MEDIÆVAL JEWISH POETRY.

Tuesday, April 8.	General Introduction.
Wednesday, April 9.	The Mental Horizon.
Thursday, April 10.	The Earlier Poets.
Friday, April 11.	Solomon Ibn Gabirol.
Monday, April 14.	Giat; Bechai; Moses Ibn Ezra; Judah Halevi.
Tuesday, April 15.	Judah Halevi (continued).
Wednesday, April 16.	Abraham Ibn Ezra; Solomon Halevi Alkabaz; Harizi.
Thursday, April 17.	Harizi (continued); Abraham Ibn Khisdai; Immanuel; Kalonymous.

LECTURERS ON THIS FOUNDATION.

1891. Edmund C. Stedman, LL. D., of New York,—"The Nature and Elements of Poetry."
1892. Professor Richard C. Jebb, LL. D., D. C. L., of the University of Cambridge,—"The Growth and Influence of Classical Greek Poetry."
1893. Professor Robert Y. Tyrrell, LL.D., Litt. D., of Trinity College, Dublin,—"The Growth and Influence of Latin Poetry."
1894. Professor Charles Eliot Norton, LL. D., D. C. L., of Harvard University,—"Dante."
1896. Professor George Adam Smith, D. D., of the Free Church College, Glasgow,—"Hebrew Poetry."
1897. M. Ferdinand Brunetière, Editor of the "Revue des Deux Mondes,"—"French Poetry."
1898. Professor Charles R. Lanman, Ph. D., of Harvard University,—"The Poetry of India."
1900. Professor Charles H. Herford, Litt. D., of the University College of Wales,—"English Poetry."
1901. Hamilton W. Mabie, Litt. D., Associate Editor of "The Outlook,"—"Poetry in America."
1902. Professor Emil G. Hirsch, D. D., LL. D., of the University of Chicago,—"Mediæval Jewish Poetry."

THE HENRICO MEDALLION.

The Colonial Dames of America, Chapter I, have presented to the Johns Hopkins University a copper medallion bas-relief which commemorates the foundation of a university at Henrico, in Virginia, in the year 1619. Their object in having this medallion made was twofold: The commemoration of a significant but hitherto neglected event in Colonial History, and the encouragement of the study of American History.

It is the intention of the Society to bestow the medallion annually upon a graduate or student of the Johns Hopkins University, not more than ten years after his receiving the degree of A. B., for work of special excellence in early American History, the alumnus best deserving that distinction to be designated by the proper University authorities. The medallion was designed and executed by Dr. A. J. Volck, of Baltimore, and the artistic theme is the Destruction of the University at Henrico in the great Indian Massacre of 1622.

HISTORY OF HENRICO UNIVERSITY.

The little town of Henrico was situated on the James River at the point now known as Dutch Gap, not far from the place where the City of Richmond now stands, and was intended to be the capital of Virginia. It was laid out a few years before the founding of the University, and had as many as three streets of well-framed houses, with a church; and was protected by five block-houses and a ditch and pale over a mile in length.

In the foundation at Henrico the University idea was clearly prominent, as is evident from the wording of the grant, which makes a distinction between the "University in time to come" and the "college" which was to be builded immediately. The scheme determined upon included not only the College for Indians as the beginning of a University, but a Free School as a feeder for the college.

The records of the Virginia Company of London, the proprietors of the Plantation of Virginia, contain the history of the university. The first records begin in 1619. Before that time there were few, if any, kept, and such as they had were, when the Company was overthrown in 1624, turned over to the Keeper of the Council Chest by order of the Privy Council and destroyed. From April 28, 1619, to June 27, 1624, fairly regular records were kept. A copy of these, attested on each page by the Secretary and another witness, was made and secreted by the President, the Earl of Southampton, when the records were destroyed. By successive transfers this manuscript copy passed from the Southampton family to William Byrd, of Virginia; to Rev. William Smith, President of William and Mary; to Peyton Randolph, President of the first Continental Congress; to Thomas Jefferson; and to the United States. It is now in the Library of Congress.

From these records and a few scattered letters we learn the following facts. A collection was authorized by King James early in 1618 for a college in Virginia "for the training up of the children of Infidels." On November 18, 1618, in a letter to Governor Yeardley, who was about to sail for Virginia, the Company refers to this proposed college and instructed him "according to a former grant hereby ratified and confirmed" upon his arrival to have "a convenient place chosen and set out for the planting of a University at the said Henrico, in time to come, and in the meantime preparations to be made for the building of the said college," and the Company directed that 10,000 acres of land be allotted and set apart therefor.

Governor Yeardley sailed January 19, 1619, and arrived at Jamestown April 19 in the same year. He immediately convened the first popular legislature ever held in America, which at once "took measures towards the erection of a University and college." It is not definitely shown what were the exact measures taken. We are told that a petition was presented by prominent citizens, asking aid for the college and university, and that funds were raised for the founding of a college, partly for missionary work and partly for the benefit of the clergy. On August 2, 1619, it was enacted that "each Towne Citty Borough and Plantation do obtain unto themselves by just means a certain number of native Indian children to be educated . . . . so as to be fitted for the college intended for them."

As the approval of the Company was necessary, the proceedings of this legislature were sent to the Company in London and were probably destroyed with the other papers. The minutes of the Company show that the laws of 1619 were submitted to the General Court and approved by the Treasurer, but a quorum was not present, and the matter went over to a day named. Of this appointed day there are no minutes, so that we have no certain knowledge of their approval by the Company. There is, however, strong inference of this approval in the fact that at least one of these laws was acted upon by the Company and accepted by the people of Virginia, viz: the law of August 22, 1619. Acting in accordance with this law, it was proposed to make the Proprietors of Smith Hundred educate a certain number of young Indians, under a promised donation of £550 from one signing himself "Dust and Ashes." The Proprietors of Smith Hundred offered £100 to be relieved from the obligation; but notwithstanding this the General Court required them to assume the burden.

The first references to the university and college in the Proceedings of the Company are found under date of May 16, 1619, reciting how authority had been given by the King to the Bishops for a collection for a college, and "considering what publique notice may be taken in foreshowing to sett forward the action." They say that £1500 has been collected, £500 being in cash and £800 loaned the Company. They agree to provide an annual revenue and out of that to begin the erection of a college. They "would also that a piece of land be laid out at Henrico, being the place formerly resolved of which should be called college land, that they would presently settle fifty persons on it, half the benefit of their labors to go towards the work, and for the maintenance of Tutors and Scholars, the expenses to be paid from the money in cash." This was agreed to.

On June 14, 1619, a committee was appointed, "of choice gentlemen and others of his ma'ty's counsel for Virginia concerning the college, and being weighty business and so greate that an accounting of their proceedings therein must be given to the State." This would correspond to a Board of Trustees under the control of the Privy Council.

On November 17, 1619, Sir Edwin Sandys proposed "that the tenants for the Public Land be increased next Spring to the number of 300, of which 100 were for the Governor's land, 100 for the Company's land, and 100 for the College land, which, if he were truly informed, should yield not less than 3000 lb. yearly." That would give a yearly income from lands of £1000.

In the Report of the Treasurer of the same date, on the condition of the Company, "He recalled to their (the Company's) remembrance how by their commission sent by Sir Geo. Yeardley they had appointed to be set out . . 10,000 acres of land for the University, to be planted at Henrico, of which 1000 was for the College for the conversion of infidels."

On May 11, 1620, "The Treasurer signified to the Courte the companies former resolution" whereby Mr. George Thorpe was appointed Deputy to govern the college land, "who has already gone and departed," with grant of 300 acres perpetually belonging to that place and 10 tenants to be placed upon the land. July 16, 1621, General Court gave approval to George Thorpe and will reward him "when a return from the college tenants shall enable us." . . . "We are in hopes to send to the College tenants a very sufficient minister and we desire you, Mr. Thorpe, that a house may be ready for him, and good provision to entertain him."

On the 24th of October, 1621, a committee was appointed by the General Court to consider an offer of the Rev. Mr. Copland to procure funds for a Free School in Virginia. By October 30, that year, the committee found the sum of £100 subscribed, and agreed to locate a Public Free School at Charles City, now City Point, to be called the East Indian School, in honor of the East Indian Merchants who were its benefactors. They recommended that 1000 acres of land be appropriated, and five persons, beside the overseer, should be sent to work it; further, that this school should be dependant upon the college in Virginia. All of these recommendations were accepted by the General Court. An usher was appointed January 25, 1622, but he declined unless he might have the title of master. The massacre occurred soon after and nothing further was done in the matter.

During this time there were many donations to the university and college, such as "a Communion table and set" and "£550 in gold Feb. 2, 1620," some books and "a most curious map of all that coast of America." "Master Thomas Bargave, their Preacher there deceased, gave a Librarie, valued at one hundred Markes." In another case "Master Nicholas Farrar deceased, hath by his Will given three hundred pounds to the College, to be paid when there shall be ten young Salvages placed in it, in the meantime foure and twenty pound yearely to bee distributed unto three discreet and godly young men in the Colony, to bring up three wilde young infidels in some good course of life." A legacy of £100 from Geo. Ruggles, November 20, 1622, was probably made before the massacre.

The last act of the Virginia Company, in regard to the university at Henrico, was the election of the Rev. Patrick Copland as Rector July 3, 1622, only a few days before the news of the massacre reached England. He does not appear to have accepted, but remained in England.

On March 22, 1622, there was a general uprising of the Indians all over the settled portions of Virginia, followed by a massacre of the settlers. The Indians were led by Opachancano. 347 men, women and children were killed out of a total population of 1258, and it is probable that the loss would have been far greater if a converted Indian named Perry had not given information in time to have Jamestown and some of the lower settlements warned. Among the victims was George Thorpe, Superintendent of the college lands, and with him perished seventeen of the college tenants, all men. It is this "worthy religious Gentleman" George Thorpe whom the artist has made the central figure in the medallion. The survivors fled towards Jamestown, leaving the settlements practically deserted, a desolation from which they did not soon recover. A message of encouragement was sent to the college people by the Company, and a new Deputy was appointed in the place of Mr. Thorpe, with promise of new tenants, but all of no avail, for the life of the first University had passed away in the great massacre.

ENUMERATION OF CLASSES, SECOND HALF-YEAR, 1901-1902.

Mathematics. (48 Students).

Classes meet in the Physical Laboratory, except as otherwise stated.

Mathematical Seminary: Professor Morley. Wednesday, 4.30 p. m., Room 26. (13).

Brooks, C. E.
Carver, W. B.
Coble, A. B.
Converse, H. A.
Cross, H. I.
Gillespie, D. C.
Grove, C. C.
Hun, J. G.
MacDonald, W. E.
Phillips, H. B.
Sparrow, C. M.
Stephens, R. P.
Thomas, R. Z.

Geometry: Professor Morley. Monday, 10 a. m., Tuesday and Wednesday, 9 a. m., Room 26. (10).

Brooks, C. E.
Carver, W. B.
Coble, A. B.
Converse, H. A.
Gillespie, D. C.
Grove, C. C.
Hun, J. G.
Phillips, H. B.
Stephens, R. P.
Thomas, R. Z.

Kinematics: Professor Morley. Thursday and Friday, 9 a. m., Room 26. (7).

Brooks, C. E.
Carver, W. B.
Coble, A. B.
Converse, H. A.
Cross, H. I.
Hun, J. G.
Thomas, R. Z.

Galois Theory: Dr. Cohen. Thursday, 10 a. m., Friday, 11 a. m., Room 26. (3).

Coble, A. B.
Converse, H. A.
Hun, J. G.

Advanced Differential Equations: Dr. Cohen. Wednesday and Friday, 10 a. m., Room 26. (5).

Carver, W. B.
Coble, A. B.
Cross, H. I.
Hun, J. G.
Thomas, R. Z.

Elementary Theory of Functions: Dr. Cohen. Monday and Tuesday, 11 a. m., Room 26. (11).

Barnes, J.
Barrett, J. T.
Brooks, C. E.
Carver, W. B.
Converse, H. A.
Cross, H. I.
Edmunds, C. K.
Gillespie, D. C.
Hill, H. D.
Phillips, H. B.
Thomas, R. Z.

Differential Equations: (*Undergraduate Elective*): Dr. Cohen. Monday, 9 a. m., Tuesday, 10 a. m., Room 26. (13).

Brooks, C. E.
Gillespie, D. C.
Gillespie, H. C.
Grove, C. C.
Koppelman, W. H.
MacDonald, W. E.
Nelson, A. H.
Phillips, H. B.
Porter, J. T.
Reynolds, W. F.
Sisco, G. E.
Sparrow, C. M.
Stephens, R. P.

Projective Geometry; Solid Analytic Geometry: Professor Hulburt. Daily, except Monday, 9 a. m., Room 27. (7).

Ammen, W. W.
MacDonald, W. E.
Robinson, C. A.
Schmeisser, E. G.
Sparrow, C. M.
Stephens, R. P.
Strayer, G. D.

Differential and Integral Calculus: (*Minor Course*): Professor Hulburt. Monday, 9 a. m., Tuesday, 10 a. m., Wednesday, 11 a. m., Thursday, 12 m., Room 27. (11).

Buckler, R.
Cohen, L. S.
Combs, J. M.
Getman, F. H.
Gutman, E. J.
Kohn, W. W.
Louis, H. C. E.
Miller, H. C.
Numsen, J. N.
Schapiro, S. H.
Wallis, L. G.

Solid Geometry; Analytic Geometry: Mr. Hun. Monday, 9 a. m., Tuesday, 10 a. m., Wednesday, 11 a. m., Thursday, 12 m, Room 7, McCoy Hall. (10).

Baetjer, W. A.
Baldauf, L. D.
Dettelbach, P.
Emig, J. W.
Foster, G. A.
Jackson, R. N.
Kohn, I. H.
Pearre, S.
Strobhar, T. S.
Strouse, J.

Physics. (57 Students).

Classes meet in the Physical Laboratory.

Physical Seminary: Professor Ames. Monday, 3 p. m., Room 23. (13).

The instructors in Physics and the following students:

Barnes, J.
Barrett, J. T.
Edmunds, C. K.
Hill, H. D.
Hoffman, E. J.
Hyde, E. P.
King, S. H.
Middlekauff, G.W.
Moore, J. H.
Nelson, A. H.
Parsons, L. A.
Porter, J. T.
Whitehead, J. B.

Journal Meeting: Professor Ames. Wednesday, 11 a. m., Room 23. (13).

The instructors in Physics and the following students:

Barnes, J.
Barrett, J. T.
Edmunds, C. K.
Hill, H. D.
Hoffman, E. J.
Hyde, E. P.
King, S. H.
Middlekauff, G.W.
Moore, J. H.
Nelson, A. H.
Parsons, L. A.
Porter, J. T.
Whitehead, J. B.

Mechanics: Professor Ames. Monday, Tuesday, Wednesday, 9 a. m., Room 24. (10).

Barnes, J.
Barrett, J. T.
Edmunds, C. K.
Hill, H. D.
Hyde, E. P.
King, S. H.
Middlekauff, G.W.
Moore, J. H.
Parsons, L. A.
Whitehead, J. B.

Physical Optics: Professor R. W. Wood. Tuesday, Wednesday, and Thursday, 12 m., Room 24. (8).

Barrett, J. T.
Edmunds, C. K.
Hill, H. D.
Hyde, E. P.
Middlekauff, G.W.
Moore, J. H.
Parsons, L. A.
Whitehead, J. B.

Recent Progress in Experimental Physics: Professor R. W. Wood. Monday, 4 p. m., Room 18.

General Physics: (*Major Course*): Professor Bliss. Daily, except Thursday, 12 m., Room 18. (18).

Brooks, C. E.
Bruner, L. U.
Carver, W. B.
Gillespie, D. C.
Gillespie, H. C.
Grove, C. C.
King, S. H.
Koppelman, W. H.
Lindsay, C. F.
MacDonald, W. E.
Nelson, A. H.
Porter, J. T.
Reynolds, W. F.
Robinson, C. A.
Schmeisser, E. G.
Sisco, G. E.
Sparrow, C. M.
Stephens, R. P.

General Physics: (*Minor Course*): Professor Ames and Dr. Huff. Daily, except Tuesday, 10 a. m., Room 18. (30).

Adler, S. H.
Austrian, C. R.
Branch, J. R. B.
Branham, H. G.
Cator, B. F.
Clowes, E. S.
Combs, J. M.
Dochez, A. R. V.
Falk, K. G.
Fuerbringer, R. O.
Grasty, J. S.
Gutman, E. J.
Hawkins, J. C. L.
Hill, E. C.
Hoffman, E. J.
King, S. H.
Le Cron, W. L.
Louis, H. C. E.
Maynard, T. P.
Nelson, A. H.
Nicholson, R. J.
Opie, R.
Parsons, W. T.
Phillips, H. B.
Porter, F. G.
Rosenthal, M. W.
Strayer, G. D.
Toms, K. S.
Tough, L. M.
Wayson, N. E. W.

Applied Electricity: Mr. Whitehead. Thursday and Friday, 9 a. m., Room 24. (3).

Barnes, J.
Hill, H. D.
Porter, J. T.

Electrical Laboratory: Mr. Whitehead. Daily, 2–5 p. m. (7).

Barnes, J.
Barrett, J. T.
Hill, H. D.
Hyde, E. P.
Middlekauff, G.W.
Moore, J. H.
Porter, J. T.

Astronomy: Dr. Huff. Thursday, 12 m., Room 34. (9).

Barrett, J. T.
Converse, H. A.
Fuerbringer, R. O.
Grove, C. C.
Hill, H. D.
Hyde, E. P.
MacDonald, W. E.
Nelson, A. H.
Stephens, R. P.

Laboratory Work: Professors Ames, Wood, and Bliss, Mr. Whitehead, and Dr. Huff. Daily, 9 a. m. to 5 p. m. (57).

Adler, S. H.
Austrian, C. R.
Barnes, J.
Barrett, J. T.
Branch, J. R. B.
Branham, H. G.
Brooks, C. E.
Bruner, L. U.
Carver, W. B.
Cator, B. F.
Clowes, E. S.
Combs, J. M.
Converse, H. A.
Dochez, A. R. V.
Edmunds, C. K.
Falk, K. G.
Fuerbringer, R O.
Gillespie, D. C.
Gillespie, H. C.
Grasty, J. S.
Grove, C. C.
Gutman, E. J.
Hawkins, J. C. L.
Hill, E. C.
Hill, H. D.
Hoffman, E. J.
Hyde, E. P.
King, S. H.
Koppelman, W. H.
Le Cron, W. L.
Lindsay, C. F.
Louis, H. C. E.
MacDonald, W. E.
Maynard, T. P.
Middlekauff, G.W.
Moore, J. H.
Nelson, A. H.
Nicholson, R. J.
Opie, R.
Parsons, L. A.
Parsons, W. T.
Phillips, H. B.
Porter, F. G.
Porter, J. T.
Reynolds, W. F.
Robinson, C. A.
Rosenthal, M. W.
Schmeisser, E. G.
Sisco, G. E.
Sparrow, C. M.
Stephens, R. P.
Strayer, G. D.
Toms, K. S.
Tough, L. M.
Ver Planck, J. de L.
Wayson, N. E. W.

Chemistry. (90 Students).

Classes meet in the Chemical Laboratory, except as otherwise stated.

Carbon Compounds: (*For Graduate Students*): Professor Remsen. Monday, Tuesday, and Wednesday, 9 a. m. (25).

Carroll, C. G.
Carver, B. F.
Case, W. A.
Clark, F. E.
Clowes, E. S.
Coony, J. P.
Doughty, H. W.
Falk, K. G.
Getman, F. H.
Graff, M. B.
Hall, E. S.
King, J. H.
Lindsay, C. F.
Powell, M. W.
Schaub, I. O.
Schaun, P. E.
Seidell, A.
Shipley, S. D.
Straus, H. P.
Taveau, R. de M.
Wada, I.
Weedon, W. S.
West, A. P.
Winter, W. P.
Yamaguchi, K.

Journal Meeting: Professor Remsen. Saturday, 9–10.30 a. m. (23). The instructors in Chemistry and the following students:

Carroll, C. G.
Carver, B. F.
Case, W. A.
Clark, F. E.
Clowes, E. S.
Coony, J. P.
Doughty, H. W.
Falk, K. G.
Getman, F. H.
Graff, M. B.
Hall, E. S
King, J. H.
Lindsay, C. F.
Schaub, I. O.
Schaun, P. E.
Seidell, A.
Shipley, S. D.
Straus, H. P.
Taveau, R. de M.
Wada, I.
Weedon, W. S.
Winter, W, P.
Yamaguchi, K.

Inorganic Chemistry: (*For Graduate Students*): Professor Morse. Thursday and Friday, 9 a. m. (25).

Carroll, C. G.
Carver, B. F.
Case, W. A.
Clark, F. E.
Clowes, E. S.
Coony, J. P.
Doughty, H. W.
Falk, K. G.
Getman, F. H.
Graff, M. B.
Hall, E. S.
King, J. H.
Lindsay, C. F.
Powell, M. W.
Schaub, I. O.
Schaun, P. E.
Seidell, A.
Shipley, S. D.
Straus, H. P.
Taveau, R. de M.
Wada, I.
Weedon, W. S.
West, A. P.
Winter, W. P.
Yamaguchi, K.

Physical Chemistry: Associate Professor Jones. Monday, Tuesday, and Wednesday, 12 m. (15).

Barnes, J.
Carroll, C. G.
Coony, J. P.
Doughty, H. W.
Falk, K. G.
Getman, F. H.
King, J. H.
Martin, E. G.
Schaub, I. O.
Seidell, A.
Shrove, F.
Taveau, R. de M.
Wada, I.
Winter, W. P.
Yamaguchi, K.

Inorganic Chemistry: (*Major Course*): Dr. Gilpin. Daily, except Monday, 9 a. m. (26).

Adler, S. H.
Bamberger, E. S.
Blanck, F. C.
Bryan, J. W.
Combs, J. M.
Custis, J. B.G.
Gillespie, H. C.
Hanna, C. L.
Hazlehurst, F.
Hoffman, R. C.
Matthai, W. H.
Nelson, J. M.
Nordin, G. A.
Parsons, W. T.
Pessagno, E. L.
Plaggemeyer, H.W.
Riley, C. W.
Sandrock, E. P.
Smith, J. T.
Snively, H. N.
Straus, P. R.
Stubenrauch, C. H.
Townsend, G. W.
Toms, K. S.
Treide, H. E.
Winternitz, M. C.

General Chemistry: (*Minor Course*): Professor Renouf and Dr. Waters. Daily, except Monday, Hopkins Hall, 9 a. m. (35).

Austrian, C. R.
Bird, W. S.
Blum, S.
Branch, J. R. B.
Branham, H. G.
Buckler, R.
Cator, B. F.
Cohen, L. S.
Dettelbach, P.
Dochez, A. R. V.
Emig, J. W.
Gutman, E. J.
Hawkins, J. C. L.
Hendry, M. W.
Hoffman, E. J.
Hopper, S. C.
Hunley, W. M.
Kirby, F. J.
Kohn, W. W.
Lanier, R. S.
Le Cron, W. L.
Louis, H. C. E.
Markell, C.
Maynard, T. P.
Miller, H. C.
Murkland, W. U.
Numsen, J. N.
Opie, R.
Porter, F. G.
Rutledge, J. J.
Schmeisser, W. C.
Schwatka, J. B.
Strobhar, T. S.
Wallis, L. G.
Wayson, N. E. W.

Laboratory Work: Professor Remsen, Professor Morse, Professor Renouf, Associate Professor Jones, Dr. Gilpin, Dr. Waters, Dr. Frazer. Daily, 9 a. m. to 5 p. m. (89).

Adler, S. H.
Austrian, C. R.
Bamberger, E. S.
Bird, W. S.
Blanck, F. C.
Blum, S.
Branch, J. R. B.
Branham, H. G.
Bryan, J. W.
Buckler, R.
Carroll, C. G.
Carver, B. F.
Case, W. A.
Cator, B. F.
Clark, F. E.
Clowes, E. S.
Cohen, L. S.
Combs, J. M.
Coony, J. P.
Custis, J. B. G.
Dettelbach, P
Dochez, A. R. V.
Doughty, H. W.
Emig, J. W.
Falk, K. G.
Getman, F. H.
Gillespie, H. C.
Graff, M. B.
Gutman, E. J.
Hall, E. S.
Hanna, C. L.
Hawkins, J. C. L.
Hazlehurst, F.
Hendry, M. W.
Hoffman, E. J.
Hoffman, R. C.
Hopper, S. C.
Hunley, W. M.
King, J. H.
Kirby, F. J.
Kohn, W. W.
Lanier, R. S.
Le Cron, W. L.
Lindsay, C. F.
Louis, H. C. E.
Markell, C.
Martin, E. G.
Matthai, W. H.
Maynard, T. P.
Miller, H. C.
Murkland, W. U.
Nelson, J. M.
Nordin, G. A.
Numsen, J. N.
Opie, R.
Parsons, W. T.
Pessagno, E. L.
Pinkerton, T. C.
Plaggemeyer, H. W.
Porter, F. G.
Powell, M. W.
Riley, C. W.
Rutledge, J. J.
Sandrock, E. P.
Schaub, I. O.
Schaun, P. E.
Schmeisser, W. C.
Schwatka, J. B.
Seidell, A.
Shipley, S. D.
Shreve, F.
Smith, J. T.
Snively, H. N.
Straus, H. P.
Straus, P. R.
Strobhar, T. S.
Stubenrauch, C. H.
Taveau, R. de M.
Toms, K. S.
Townsend, G. W.
Treide, H. E.
Wada, I.
Wallis, L. G.
Wayson, N. E. W.
Weedon W. S.
West, A. P.
Winter, W. P.
Winternitz, M. C.
Yamaguchi, K.

Geology. (26 Students).

Classes meet in the Geological Laboratory.

Historical Geology: Professor Clark. Wednesday, 10 a. m. (3).

Johannsen, A.
Miller, B. L.
Rutledge, J. J.

Paleontology: (*Laboratory*): Professor Clark and Dr. Martin. Daily. (4).

Johannsen, A.
Miller, B. L.
Rutledge, J. J.
Twitchell, M. W.

Economic Geology: Professor Clark. Monday, 10 a. m. (3).

Johannsen, A.
Miller, B. L.
Rutledge, J. J.

General Geology: (*Minor Course*): Professor Clark and Dr. Shattuck. Daily, except Friday, 1 p. m.; laboratory work, Wednesday afternoon; excursion, Saturday. (11).

Gudger, E. W.
Hoffman, R. C.
James, B.B.
Putts, B. S.
Sharretts, R. C.
Smith, S.
Straus, P. R.
Townsend, G.W.
Twitchell, M. W.
Warner, H. A.
Weedon, W. S.

Experimental Geology: Professor Reid. Tuesday and Thursday, 10 a. m. (4).

Carver, W. B.
Johannsen, A.
Miller, B. L.
Rutledge, J. J.

Petrography: Associate Professor Mathews. Monday, Tuesday, and Wednesday, 11 a. m.; laboratory work, Monday and Tuesday. (6).

Bibbins, A.
Johannsen, A.
Miller, B. L.
Rutledge, J. J.
Twitchell, M. W.
West, A. P.

Mineralogy: (*Major Geology*): Associate Professor Mathews. Daily, except Friday, 12 m.; laboratory work, Monday and Tuesday. (11).

Carver, B. F.
Hoffman, W. E.
Johannsen, A.
Miller, B. L.
Pinkerton, T. C.
Powell, M. W.
Rutledge, J. J.
Schaun, P. E.
Shippen, L. P.
Taveau, R. de M.
Twitchell, M. W.

Journal Club: Professors Clark and Reid. Thursday, 9 a. m. (10).

Bibbins, A.
Duerden, J. E.
Fassig, O. L.
Hindshaw, H. H.
Johannsen, A.
Martin, G. C.
Mathews, E. B.
Miller, B. L.
Rutledge, J. J.
Shattuck, G. B.
Twitchell, M. W.

Biological Sciences. (119 Students).

Classes meet in the Biological Laboratory, except as otherwise stated.

Advanced Zoology: Professor Brooks. Daily, except Friday, 11 a. m. (12).

Coker, R. E.
Cowles, R. P.
Duerden, J. E.
Glaser, O. C.
Grave, C.
Gudger, E. W.
Martin, E. G.
Perkins, H. F.
Rittenhouse, S.
Shoemaker, D. N.
Shreve, F.
Tennent, D. H.

Zoological and Botanical Journal Club: Professor Brooks, Dr. Andrews, Dr. Johnson, Dr. Barton. Friday, 11 a. m. (15).

Coker, R. E.
Cowles, R. P.
Duerden, J. E.
Glaser, O. C.
Grave, C.
Gudger, E. W.
James, B. B.
Martin, E. G.
Metcalf, M. M.
Miller, B. L.
Perkins, H. F.
Rittenhouse, S.
Shoemaker, D. N.
Shreve, F.
Tennent, D. H.

Zoology: (*Biology Major*): Professor Brooks and Dr. Grave. Monday and Tuesday, 2–5 p. m., until April 1. (12).

Beasley, E. B.
Coker, R. E.
Gudger, E. W.
Hazen, H. H.
Macht, D. I.
Martin, E. G.
McGlone, B.
Moore, R. E.
Rittenhouse, S.
Shreve, F.
Wolman, S.
Wroth, P.

Embryology: (*Biology Major*): Associate Professor Andrews and Dr. Grave. Daily, except Monday, 9 a. m.; Monday and Tuesday, 2–5 p. m., after April 1. (21).

Beasley, E. B.
Bernheim, B. M.
Coker, R. E.
Cutter, W. D.
Davis, A. W.
Dowman, C. E.
Gudger, E. W.
Hall, F. J.
Hazen, H. H.
Hooker, D. R.
Houghton, H. S.
Lankford, H. M.
Leopold, E. J.
Macht, D. I.
Martin, E. G.
McGlone, B.
Moore, R. E.
Rittenhouse, S.
Smead, L. F.
Wolman, S.
Wroth, P.

Botany: (*Biology Major*): Associate Professor Johnson. Daily, except Monday, 9 a. m., until April 1. (12). [See Zoology].

Botany: (*Morphology of Plants*): Associate Professor Johnson. Monday, 11 a. m.; Thursday and Friday, 12 m.; Wednesday, Thursday and Friday, 2–5 p. m. (6).

Coker, R. E.
Cowles, R. P.
James, B. B.
Rittenhouse, S.
Shoemaker, D. N.
Shreve, F.

Botany: (*Undergraduate Elective*): Associate Professor Johnson. Thursday and Friday, 2–5 p. m. (1).

Straus, H. P.

Physiological Journal Club: Professor Howell. Monday, 5 p. m., Physiological Laboratory. (11).

Bardeen, C. R.
Baumgarten, W.
Dawson, P. M.
Emerson, C. P.
Erlanger, J.
Hunt, R.
Lathrop, R. W.
Lewis, W. H.
Loevenhart, A. S.
Manwaring, W. H.
Stiles, P. G.

Physiology of the Tissues (*Muscle, Nerve, Blood*): Professor Howell. Wednesday and Thursday, 12 m., Physiological Laboratory. [January 6 to March 15]. (71).

First Year Medical Students.

Abercrombie, R.T.
Baer, C. A.
Baldauf, L. K.
Ballou, A. M.
Beeson, M. A.
Bernheim, B. M.
Briscoe, J. S.
Constantine, K.W.
Cowles, C. D.
Cutter, W. D.
Danforth, M S.
Dascombe, O. H.
Davenport, H. I.
Davidson, H. J.
Davis, A. W.
Dodds, S. A.
Dowman, C. E.
Eyster, J. A. E.
Faris, C. M.
Ford, F. R.
Freeman, A. W.
Gilman, P. K.
Grier, S. M.
Hale, E.
Hall, F J.
Haller, J. T.
Hempstead, H.
Hengerer, L.
Hepburn, N. T.
Hill, P. S.
Hooker, D. R.
Houghton, E.
Houghton, H. S.
Lankford, H. M.
Lawson, G. B.
Leopold, E. J.
Marine, D.
Martelle, H. A.
McDonald, A. L.
Mehard, W. M.
Meyer, A. W.
Moseley, B. O.
Moss, W. L.
Mumford, E. B.
Paullin, J E.
Post, A. L.
Rehberger, G. E.
Rhea, L. J.
Richardson, E. H.
Ricksher, C.
Rindlaub, M. P.
Risher, F. O.
Robinson, E. H.
Schloss, O. M.
Slocum, R. B.
Smead, L. F.
South, W. H.
Stone, C. W.
Stone, M. L.
Towles, C. R.
Tuttle, L.
Vander Hoof, D.
Van Voast, R. A.
Ward, E. H. P.
Whipple, G. H.
Will, H. I.
Williams, H. S.
Winn, N. L.
Wright, T. M.
Young, F. L.
Youtz, H. L.

Physiology of Circulation. Dr. Dawson. Thursday and Friday, 12 m., Physiological Laboratory. [March 15 to June 1]. (71).

First Year Medical Students (as above).

Physiology of Digestion, Secretion, and Nutrition: Professor Howell and Dr. Erlanger. Monday, Tuesday, and Wednesday, 12 m., Physiological Laboratory. [March 15 to June 1]. (71).

First Year Medical Students (as above).

General Biology: (*Minor Course*): Associate Professor Andrews. Daily, except Tuesday, 10 a. m.; Thursday and Friday, 2-5 p. m. (29).

Beeuwkes, H.
Bernheim, E. P.
Campbell, J. G.
Custis, J. B. G.
Duerden, J. E.
Freeman, A. W.
Graff, M. B.
Gudger, E. W.
Guggenheimer, F. L.
Hanna, C. L.
Hazen, H. H.
Hoffman, W. E.
Iglehart, F. N.
James, B. B.
Mower, F. D.
Murphy, L. C.
Nordin, G. A.
Pels, I. R.
Putts, B. S.
Riley, C. W.
Shippen, L. P.
Slemons, J. A.
Smith, J. T.
Snively, H. N.
Stone, H. B.
Strouse, S.
Tennent, D. H.
Townsend, G. W.
Twitchell, M. W.

Laboratory Work: Professors Brooks and Howell, Associate Professors Andrews and Johnson, Dr. Dawson, Dr. Erlanger, Mr. Stiles, and Dr. Grave. Daily, 9 a. m. to 5 p. m., Biological and Physiological Laboratories. (116).

Abercrombie, R. T.
Baer, C. A.
Baldauf, L. K.
Ballou, A. M.
Beasley, E. B.
Beeson, M. A.
Beeuwkes, H.
Bernheim, B. M.
Bernheim, E. P.
Briscoe, J. S.
Campbell, J. G.
Coker, R. E.
Constantine, K. W.
Cowles, C. D.
Cowles, R. P.
Custis, J. R. G.
Cutter, W. D.
Danforth, M. S.
Dascombe, O. L.
Davenport, H. I.
Davidson, H. J.
Davis, A. W.
Dodds, S. A.
Dowman, C. E.
Duerden, J. E.
Eyster, J. A. E.
Faris, C. M.
Ford, F. R.
Freeman, A. W.
Gilman, P. K.
Glaser, O. C.
Graff, M. B.
Grier, S. M.
Gudger, E. W.
Guggenheimer, F. L.
Hale, E.
Hall, F. J.
Haller, J. T.
Hanna, C. L.
Hazen, H. H.
Hempstead, H.
Hengerer, L.
Hepburn, N. T.
Hill, P. S.
Hoffman, W. E.
Hooker, D. R.
Houghton, E.
Houghton, H. S.
Iglehart, F. N.
James, B. B.
Lankford, H. M.
Lawson, G. B.
Leopold, E. J.
Loevenhart, A. S.
Macht, D. I.
Marine, D.
Martin, E. G.
Martelle, H. A.
McDonald, H. L.
McGlone, B.
Mehard, W. M.
Meyer, A. W.
Miller, B. L.
Moore, R. E.
Moseley, B. O.
Moss, W. L.
Mower, F. D.
Mumford, E. B.
Murphy, L. C.
Nordin, G. A.
Paullin, J. E.
Pels, I. R.
Perkins, H. F.
Post, A. L.
Putts, B. S.
Rehberger, G. E.
Rhea, L. J.
Richardson, E. H.
Ricksher, C.
Riley, C. W.
Rindlaub, M. P.
Risher, F. O.
Rittenhouse, S.
Robinson, E. H.
Schloss, O. M.
Shippen, L. P.
Shoemaker, D. N.
Shreve, F.
Slemons, J. A.
Slocum, R. B.
Smead, L. F.
Smith, J. T.
Snively, H. N.
South, W. H.
Stone, C. W.
Stone, H. B.
Stone, M. L.
Straus, H. P.
Strouse, S.
Tennent, D. H.
Towles, C. R.
Townsend, G. W.
Tuttle, L.
Twitchell, M. W.
Vander Hoof, D.
Van Voast, R. A.
Ward, E. H. P.
Whipple, G. H.
Will, H. I.
Williams, H. S.
Winn, N. L.
Wolman, S.
Wright, T. M.
Wroth, P.
Young, F. L.
Youtz, H. L.

Greek. (31 Students).

Classes meet in McCoy Hall.

Greek Seminary: *Plato:* Professor GILDERSLEEVE. Monday and Wednesday, 10 a. m., Room 14. (18).

Berg, G. O.
Bixler, E. C.
Dodge, A.
Fogle, A. W.
Gray, J. F.
Guernsey, R.
Jervey, H. W.
Johnson, R. H.
Leutner, W. G.
Machen, J. G.
McKnight, R. J.G.
Moll, W. L.
Murphy, J. F. X.
Pyle, T. L.
Raney, L.
Sanders, H. N.
Seiple, W. G.
Shear, T. L.

Preplatonic Philosophy: Professor GILDERSLEEVE. Thursday, 10 a. m., Room 14. (22).

Barret, L. C.
Berg, G. O.
Bixler, E. C.
Dodge, A.
Edwards, P. H.
Fogle, A. W.
Gray, J. F.
Guernsey, R.
Jervey, H. W.
Johnson, R. H.
Leutner, W. G.
Machen, J. G.
McKnight, R. J.G.
Moll, W. L.
Mood, J. R.
Murphy, J. F. X.
Pyle, T. L.
Ramsay, R. L.
Raney, L.
Sanders, H. N.
Seiple, W. G.
Shear, T. L.

Greek Syntax; Homeric Readings: Professor GILDERSLEEVE. Tuesday and Friday, 10 a. m., Room 14. (22).

Barret, L. C.
Berg, G. O.
Bixler, E. C.
Dodge, A.
Edwards, P. H.
Fogle, A. W.
Gray, J. F.
Guernsey, R.
Jervey, H. W.
Johnson, R. H.
Leutner, W. G.
Machen, J. G.
McKnight, R. J.G.
Moll, W. L.
Mood, J. R.
Murphy, J. F. X.
Pyle, T. L.
Ramsay, R. L.
Raney, L.
Sanders, H. N.
Seiple, W. G.
Shear, T. L.

Aristotle's Nicomachean Ethics: Associate Professor MILLER. Tuesday and Thursday, 9 a. m., Room 15. (11).

Berg, G. O.
Bixler, E. C.
Dodge, A.
Johnson, R. H.
Leutner, W. G.
Machen, J. G.
Moll, W. L.
Murphy, J. F. X.
Raney, L.
Sanders, H. N.
Shear, T. L.

Advanced Prose Composition: Associate Professor MILLER. Friday, 9 a. m., Room 19. (3).

Pyle, T. L.
Raney, L.
Sanders, H. N.

Lyric Poets; Sophocles, *Antigone:* (*Major Course*): Associate Professor SPIEKER. Monday, Tuesday, and Wednesday, 12 m., Room 10. (5).

Clarke, A. H.
Hendry, M. W.
Meeks, B. W.
Murkland, W. U.
Williams, F. R. V.

Lysias, *Epitaphius;* ***Euripides,*** *Hippolytus:* (*Minor Course*): Associate Professor SPIEKER. Tuesday, Wednesday, and Thursday, 1 p. m., Room 10. (3).

Neal, C. A.
Nicholson, R. J.
Saylor, C. H.

Prose Composition: Associate Professor SPIEKER.

Major Course: Friday, 12 m., Room 10. (5).

Clarke, A. H.
Hendry, M. W.
Meeks, B. W.
Murkland, W. U.
Williams, F. R. V.

Minor Course: Monday, 1 p. m., Room 10. (3).

Neal, C. A.
Nicholson, R. J.
Saylor, C. H.

Herodotus; Prose Composition: Associate Professor MILLER. Monday, Thursday, and Friday, 1 p. m., Room 8. (2).

Addison, J. A.
Miller, H. C.

Latin. (58 Students).

Classes meet in McCoy Hall.

Latin Seminary: *Vergil:* Associate Professsor SMITH. Tuesday and Friday, 11 a. m., Room 15. (14).

Barret, L. C.
Berg, G. O.
Bixler, E. C.
Blackwell, I. H.
Crumley, J. J.
Dodge, A.
Edwards, P. H.
Fogle, A. W.
Leutner, W. G.
Machen, J. G.
Moll, W. L.
Mood, J. R.
Shear, T. L.
Wise, B. A.

The Roman Epic: Associate Professor SMITH. Monday, 11 a. m., Room 15. (17).

Barret, L. C.
Berg, G. O.
Bixler, E. C.
Blackwell, I. H.
Crumley, J. J.
Dodge, A.
Edwards, P. H.
Fogle, A. W.
Guernsey, R.
Leutner, W. G.
Machen, J. G.
Moll, W. L.
Mood, J. R.
Raney, L.
Roulston, R. B.
Shear, T. L.
Wise, B. A.

Ovid: Historical Development of the Roman Hexameter: (*Lectures with illustrative readings*): Associate Professor SMITH. Wednesday 11 a. m., Room 15. (17).

Barret, L. C.
Berg, G. O.
Bixler, E. C.
Blackwell, I. H.
Crumley, J. J.
Dodge, A.
Edwards, P. H.
Fogle, A. W.
Guernsey, R.
Leutner, W. G.
Machen, J. G.
Moll, W. L.
Mood, J. R.
Raney, L.
Roulston, R. B.
Shear, T. L.
Wise, B. A.

Journal Club: (*Greek and Latin*): Associate Professor SMITH. Alternate Fridays, 9 a. m., Room 15. (17).

Barret, L. C.
Berg, G. O.
Bixler, E. C.
Blackwell, I. H.
Crumley, J. J.
Dodge, A.
Edwards, P. H.
Fogle, A. W.
Guernsey, R.
Leutner, W. G.
Machen, J. G.
Moll, W. L.
Mood, J. R.
Raney, L.
Roulston, R. B.
Shear, T. L.
Wise, B. A.

Historical Latin Grammar: Dr. WILSON. Thursday, 11 a. m., Room 15. (19).

Barret, L. C.
Berg, G. O.
Bixler, E. C.
Blackwell, I. H.
Crumley, J. J.
Dodge, A.
Edwards, P. H.
Fogle, A. W.
Gray, J. F.
Guernsey, R.
Johnson, R. H.
Leutner, W. G.
Machen, J. G.
Moll, W. L.
Mood, J. R.
Murphy, J. F. X.
Raney, L.
Shear, T. L.
Wise, B. A.

Reading Class: (*For Graduates*): Dr. WILSON. Wednesday, 9 a. m., Room 15. (14).

Barret, L. C.
Berg, G. O.
Bixler, E. C.
Blackwell, I. H.
Crumley, J. J.
Dodge, A.
Edwards, P. H.
Fogle, A. W.
Leutner, W. G.
Machen, J. G.
Moll, W. L.
Mood, J. R.
Shear, T. L.
Wise, B. A.

Seneca's Tragedies: (*Elective Course*): Dr. WILSON. Tuesday, 10 a. m., Friday, 9 a. m., Room 16. (2).

Dew, A. G.
Ogle, M. B.

Plautus; Terence: (*Major Course*): Dr. WILSON. Wednesday, Thursday, and Friday, 10 a. m., Room 10. (7).

Addison, J. A.
Ammen, W. W.
Booker, J. M.
Hendry, M. W.
Miller, H. C.
Murkland, W. U.
Williams, F. R. V.

Roman Literature: (*Latin Minor*): Associate Professor SMITH. Tuesday, 9 a. m., Room 9. (17).

Baetjer, H. N.
Baldauf, A. N.
Bennett, J. L.
Crozier, W. E.
Dulany, R. G.
Erlanger, S. C.
Foster, G. A.
Geiger, A.
Humrichouse, H. H.
Lloyd, H. L.
McGlone, J.
Muhly, H. E.
Rosenfeld, M.
Rosenheim, G. B.
Stollenwerck, F.
Strouse, J.
Willis, L. M. R.

Horace: (*Minor Course*): Dr. GUERNSEY. Wednesday, Thursday, and Friday, 9 a. m., Room 12. (21).

Baetjer, H. N.
Baldauf, A. N.
Bennett, J. L.
Crozier, W. E.
Dulany, R. G.
Erlanger, S. C.
Foster, G. A.
Geiger, A.
Humrichouse, H. H.
Licking, R. S.
Lloyd, H. L.
McGlone, J.
Meeks, B. W.
Muhly, H. E.
Neal, C. A.
Rosenfeld, M.
Rosenheim, G. B.
Saylor, C. H.
Stollenwerck, F.
Strouse, J.
Willis, L. M. R.

Cicero, *De Senectute;* ***Ovid; Prose Composition:*** (*Preliminary Course*): Associate Professor SPIEKER. Wednesday, Thursday, and Friday, 10 a. m., Room 8. (10).

Baetjer, W. A.
Baldauf, L. D.
Cameron, J.
Combs, J. M.
Dettelbach, P.
Emig, J. W.
Jackson, R. N.
Kohn, L H.
Schwatka, J. B.
Strobhar, J.S.

Prose Composition:

Major Course: Dr. WILSON. Monday, 10 a. m., Room 10. (7).

Addison, J. A.
Ammen, W. W.
Booker, J. M.
Hendry, M. W.
Miller, H. C.
Murkland, W. U.
Williams, F. R.V.

Minor Course: Dr. GUERNSEY. Tuesday, 9 a. m., Room 12. (4).

Licking, R. S.
Meeks, B. W.
Neal, C. A.
Saylor, C. H.

Sanskrit and Comparative Philology. (43 Students).

Classes meet in Room 19, McCoy Hall.

Pâli and Buddhist Religion and Literature: Professor BLOOMFIELD. Thursday, 12 m. (5).

Barret, L. C.
Blake, F. R.
Drenford, G.
Kurrelmeyer, H.
Ness, J. A.

Vedic Seminary: *The Kashmirian (Pāippalāda) Veda:* Professor BLOOMFIELD. Friday, 3 p. m. (5).

Barret, L. C.
Blake, F. R.
Drenford, G.
Kurrelmeyer, H.
Ness, J. A.

Introduction to the Vedic Language: Dr. NESS. Thursday, 4 p. m. (4).

Berg, G. O.
Fowler, T. H.
Mood, J. R.
Roulston, R. B.

Advanced Sanskrit: *The Law Book of Manu:* Professor BLOOMFIELD. Tuesday, 12 m. (4).

Fowler, T. H.
Mood, J. R.
Roulston, R. B.

Elementary Sanskrit: *Whitney's Grammar; Story of Nala:* Professor BLOOMFIELD and Mr. BARRET. Monday and Friday, 12 m. (3).

Dodge, A.
Hollander, L. M.
Leutner, W. G.

Linguistic Science: *Ethnology of the Indo-European Peoples:* Monday, 4 p. m. (25).

Barret, L. C.
Baskett, W. D.
Benton, E. J.
Buffum, D. L.
Campbell, J. G.
Crane, R T.
Critchlow, F. L.
Crumley, J. J.
Dew, A. G.
Fogle, A. W.
Hand, J. P.
Harry, J. W.
Hildebrandt, L. F.
James, B. B.
Kern, A. A.
Larwill, P. H.
Leutner, W. G.
Marshall, C. A.
Moore, J. S.
Morrison, A. J.
Myers, C. A.
Ogle, M. B.
Stevens, G. L.
Williams, F. R. V.
Wright, R. H.

Indo-European Comparative Grammar: *Vowels and the new system of Ablaut:* Professor BLOOMFIELD. Wednesday, 4 p. m. (22).

Barret, L. C.
Berg, G. O.
Blake, F. R.
Bond, B. W.
Crumley, J. J.
Fogle, A. W.
Guernsey, R.
Hollander, L. M.
Kurrelmeyer, H.
Larwill, P. H.
Leutner, W. G.
Lyon, C. E.
Machen, J. G.
Miles, L. W.
Mood, J. R.
Ness, J. A.
Ramsay, R. L.
Rodeffer, J. D.
Roulston, R. B.
Schneider, J. P.
Stevens, G. L.
Wise, B. A.

Lithuanian: (*Wiedemann, Handbuch der Litauischen Sprache*): Dr. NESS. Monday, 4 p. m. (3).

Barret, L. C.
Drenford, G.
Schneider, J. P.

Oriental Seminary. (42 Students).

Classes meet in the Dillmann Library, Room 18, McCoy Hall.

History of the Ancient East (*with especial reference to the History of Israel*)*:* Associate Professor Johnston. Friday, 12 m. (5).

Benton, E. J.
Cator, G.
Crumley, J. J.
Harry, J. W.
Stone, E. D.

Historical Geography of Palestine: Associate Professor Johnston. Wednesday, 12 m. (3).

Crumley, J. J.
Oussani, G.
Seiple, W. G.

The Literature of the Old Testament: Professor Haupt and Dr. Foote. Thursday, 5 p. m. (13).

Barret, L. C.
Baskett, W. D.
Clarke, A. H.
Clowes, E. S.
Cross, H. I.
Easter, D. B.
Edmunds, C. K.
Hoffman, E. J.
Martin, E. G.
Perkins, H. F.
Sanderlin, G. B.
Stevens, G. L.
Wroth, P.

Elementary Hebrew: Professor Haupt and Dr. Foote. Wednesday, 2–4 p. m. (8).

Clarke, A. H.
Dennis, J. T.
Dew, A. G.
Hand, J. P.
Machen, J. G.
McKnight, R.J.G.
Moll, W. L.
Seiple, W. G.

Hebrew: (*Second Year's Course*)*:* Dr. Blake. Thursday, 2–4 p. m. (8).

Dennis, J. T.
Ember, A.
McKnight, R.J.G.
McPherson, W. B.
Moll, W. L.
Oussani, G.
Seiple, W. G.
Toffteen, O. A.

Exercises in Reading Hebrew at Sight and in Reading Unpointed Hebrew Texts: Dr. Rosenau. Thursday, 10 a.m. (4).

Ember, A.
McPherson, W. B.
Oussani, G.
Toffteen, O. A.

Prose Composition: (*Hebrew, Arabic, Assyrian, Syriac, Ethiopic*)*:* Professor Haupt. Tuesday, 4–5.30 p. m. (10).

Blake, F. R.
Dennis, J. T.
Driscoll, J. F.
Ember, A.
Foote, T. C.
McPherson, W. B.
Moll, W. L.
Oussani, G.
Seiple, W. G.
Toffteen, O. A.

Comparative Hebrew Grammar: Professor Haupt. Monday, 3 p. m. (7).

Dennis, J. T.
Ember, A.
Foote, T. C.
McPherson, W. B.
Oussani, G.
Seiple, W. G.
Toffteen, O. A.

Old Testament Seminary: (*Critical Interpretation of the Song of Songs*)*:* Professor Haupt. Tuesday, 3 p. m. (12).

Blake, F. R.
Driscoll, J. F.
Ember, A.
Foote, T. C.
Guttmacher, A.
McKnight, R.J.G.
McPherson, W. B.
Moll, W. L.
Oussani, G.
Rosenau, W.
Seiple, W. G.
Toffteen, O. A.

Hebrew Conversation: Dr. Rosenau. Tuesday, 9 a. m. (3).

Ember, A.
McPherson, W. B.
Toffteen, O. A.

Post-Biblical Hebrew: *Selections from the Mishnah and Talmud:* Dr. Rosenau. Tuesday 10 a. m., Thursday, 9 a. m. (2).

Ember, A.
Toffteen, O. A.

Biblical Aramaic Grammar and Critical Interpretation of the Book of Daniel: Professor Haupt. Tuesday, 2 p. m. (9).

Driscoll, J. F.
Ember, A.
Foote, T. C.
McKnight, R. J.G.
McPherson, W. B.
Moll, W. L.
Oussani, G.
Seiple, W. G.
Toffteen, O. A.

Syriac: Associate Professor Johnston. Tuesday, 12 m. (3).

Ember, A.
Foote, T. C.
Toffteen, O. A.

Elementary Arabic: Dr. Blake. Monday, 9 a. m. (7).

Ember, A.
Foote, T. C.
James, B. B.
Macht, D. I.
McKnight, R. J.G.
Seiple, W. G.
Toffteen, O. A.

Advanced Arabic: *Selections from The Arabian Nights and Arabic Geographers:* Associate Professor Johnston. Tuesday and Wednesday, 11 a. m. (2).

Dennis, J. T.
Driscoll, J. F.

Arabic Readings: (*Selections from the Koran*)*:* Mr. Oussani. Wednesday, 11 a. m. (4).

Ember, A.
Foote, T. C.
Seiple, W. G.
Toffteen, O. A.

Arabic Conversation: Mr. Oussani. Monday, 12 m. (5).

Blake, F. R.
Dennis, J. T.
Ember, A.
Foote, T. C.
Toffteen, O. A.

Elementary Ethiopic: Dr. Blake. Monday, 10 a.m. (3).

Foote, T. C.
Oussani, G.
Toffteen, O. A.

Elementary Assyrian: Dr. Foote. Monday, 11 a. m., Thursday, 12 m. (6).

Clarke, A. H.
Ember, A.
McKnight, R. J.G.
Oussani, G.
Seiple, W. G.
Toffteen, O. A.

Assyrian: *Selected Historical Texts:* (*Second Year's Course*)*:* Associate Professor Johnston. Tuesday, 10 a. m. (3).

Driscoll, J. F.
McPherson, W. B.
Toffteen, O. A.

Comparative Assyrian Grammar: Professor Haupt. Monday, 4 p. m. (6).

Ember, A.
Foote, T. C.
McPherson, W. B.
Oussani, G.
Seiple, W. G.
Toffteen, O. A.

Sumerian Hymns and Penitential Psalms: Professor Haupt. Monday, 2 p. m. (5).

Ember, A.
Foote, T. C.
McPherson, W. B.
Seiple, W. G.
Toffteen, O. A.

Old Egyptian: (*Advanced Course*)*:* Associate Professor Johnston. Friday, 11 a. m. (1).

Dennis, J. T.

Old Egyptian: (*Elementary*)*:* Friday, 10 a. m. (2).

Foote, T. C.
Toffteen, O. A.

Later Egyptian: (*Hieratic*)*:* Associate Professor Johnston. Wednesday, 10 a. m. (1).

Dennis, J. T.

The Philippines: (*Ethnographical and Linguistic Features of the Islands*)*:* Dr. Blake. Wednesday, 5 p. m. (8).

Biggs, R. J.
James, B. B.
Leutner, W. G.
Mathews, C. E.
Ness, J. A.
Seiple, W. G.
Shear, T. L.
VerPlanck, J. de L.

Tagálog for Beginners: Dr. Blake. Tuesday, 12 m. (2).

James, B. B.
Seiple, W. G.

English. (144 Students).

Classes meet in McCoy Hall.

English Seminary: *Chaucer:* Professor Bright. Tuesday and Thursday, 3–5 p. m., Room 4. (21).

Abhetmeyer, C. D.
Baskett, W. D.
Bond, B. W.
Crenshaw, J. B.
Eckenrode, H. J.
Fisher, F. C.
French, J. C.
Hollander, L. M.
Kern, A. A.
Larwill, P. H.
Miles, L. W.
Murphy, J. F. X.
Ramsay, R. L.
Rodeffer, J. D.
Routh, J. E.
Sanderlin, G. B.
Schneider, J. P.
Smull, M. N.
Stevens, G. L.
Wise, B. A.
Wright, R. H.

Historical English Grammar: *Lectures and Conferences:* Professor Bright. Tuesday and Thursday, 12 m., Room 12. (19).

Baskett, W. D.
Bond, B. W.
Eckenrode, H. J.
Fisher, F. C.
French, J. C.
Hollander, L. M.
Kern, A. A.
Larwill, P. H.
Miles, L. W.
Murphy, J. F. X.
Ramsay, R. L.
Rodeffer, J. D.
Routh, J. E.
Sanderlin, G. B.
Schneider, J. P.
Smull, M. N.
Stevens, G. L.
Wise, B. A.
Wright, R.H.

Journal Meeting: Professor Bright. Alternate Fridays, 3–5 p. m., Room 4. (22).

Abhetmeyer, C. D.
Baskett, W. D.
Bond, B. W.
Crenshaw, J. B.
Eckenrode, H. J.
Fisher, F. C.
French, J. C.
Hollander, L. M.
Johnson, R. H.
Kern, A. A.
Larwill, P. H.
Miles, L. W.
Murphy, J. F. X.
Ramsay, R. L.
Rodeffer, J. D.
Routh, J. E.
Sanderlin, G. B.
Schneider, J. P.
Smull, M. N.
Stevens, G. L.
Wise, B. A.
Wright, R. H.

Anglo-Saxon: *Bright's Anglo-Saxon Reader:* (*Major English*)*:* Professor Bright. Monday and Wednesday, 12 m., Room 8. (11).

Baskett, W. D.
Booker, J. M.
Fisher, F. C.
Haughton, J. A.
Johnson, R. H.
Kern, A. A.
Larwill, P. H.
Murphy, J. F. X.
Routh, J. E.
Schneider, J. P.
Stevens, G. L.

American Literature; English Drama: (*For Graduates*)*:* Professor Browne. Tuesday, 11 a. m., Room 7. (11).

Baskett, W. D.
Bond, B. W.
Boyer, N.
Fowler, T. H.
Hollander, L. M.
Kern, A. A.
Miles, L. W.
Routh, J. E.
Schneider, J. P.
Smull, M. N.
Stevens, G. L.

English Literature; Early Scottish Poets: (*Major Course*)*:* Professor Browne. Tuesday and Friday, 12 m., Room 8. (7).

Crane, R T.
Duck R. S.
Fowler, T. H.
Haughton, J. A.
Larwill, P. H.
Ramsay, R. L.
White, J. McD.

English Literature; Early English Texts: (*Minor Course*)*:* Professor Browne. Daily, except Friday, 1 p. m., Room 6. (15).

Beeuwkes, H.
Bernheim, E. P.
Buttner, W. J.
Cameron, J.
Crane, R. T.
Grasty, J. S.
Hand, J. P.
Hoffman, W. E.
Kirk, W.
Marshall, C. A.
Mower, F. D.
Ranlt, C. F.
Slemons, J. A.
Snively, H. N.
Sparrow, C. M.

English Literature: (*Elective*)*:* Professor Greene. Monday, 5 p. m., Thursday, 4 p. m., Room 9. (8).

Diggs, R. M.
Hand, J. P.
Hildebrandt, L. F.
Hill, W. B.
Markell, C.
Mower, McH.
Myers, C. A.
Routh, J. E.

English Literature: Professor Greene. Monday, 9 a. m., Tuesday, 10 a. m., Wednesday, 11 a. m., Room 11. (51).

Addison, J. A.
Adelsdorf, L.
Adler, S. H.
Ammen, W. W.
Baetjer, H. N.
Baldauf, A. N.
Bamberger, E. S.
Bird, W. S.
Blanck, F. C.
Blum S.
Branch, J. R. B.
Bryan, J. W.
Custis, J. B. G.
Dochez, A. R. V.
Glocker, T. W.
Hazlehurst, F.
Hendry, M. W.
Hildt, J. C.
Hoffman, R. C.
Hopper, S. C.
Humrichouse, H. H.
Hunley, W. M.
Iglehart, F. N.
Lanier, R. S.
Matthai, W. H.
Meeks, B. W.
Murkland, W. U.
Nelson, J. M.
Nicholson, R J.
Pagon, R. C.
Parsons, W. T.
Pessagno, E. L.
Plaggemeyer, H. W.
Riley, C. W.
Robinson, C. A.
Routh, J. E.
Sandrock, E. P.
Schmeisser, E. G.
Smith, J. T.
Snowden, W.
Straus, P. R.
Strayer, G D.
Stubenrauch, C. H.
Tootle, A. K.
Tough, L. M.
Townsend, G. W.
Treide, H. E.
Williams, F. R. V.
Warner, H. A.
Winternitz, M. C.
Yearley, A.

English Composition and Rhetoric: Professor Greene and Mr. French. Monday, Tuesday, and Wednesday, 12 m. (44).

Section A: Room 9.

Austrian, C. R.
Combs, J. M.
Crozier, W. E.
Foster, G. A.
Fuerbringer, R. O.
Hawkins, J. C. L.
Le Cron, W. L.
Louis, H. C. E.
McGlone, J.
Muhly, H. E.
Neal, C. A.
Numsen, J. N.
Opie, R. S.
Porter, F. G.
Rosenheim, G. B.
Saylor, C. H.
Schapiro, S. H

Section B: Room 11.

Baetjer, W. A.
Baldauf, L. D.
Bennett, J. L.
Branham, H. G.
Buckler, R.
Cator, B. F.
Cohen, L. S.
Dettelbach, P.
Dulany, R. G.
Emig, J. W.
Erlanger, S. C.
Geiger, A. L.
Kohn, I. H.
Kohn, W. W.
Lloyd, H. L.
Maynard, T. P.
Pearre, S.
Rosenfeld, M.
Rosenthal, M. W.
Schwatka, J. B.
Stollenwerck, F.
Strobhar, J. S.
Strouse, J.
Toms, K. S.
Wallis, L. G.
Wayson, N. E. W.
Willis, L. M. R.

German. (115 Students).

Classes meet in McCoy Hall.

German Seminary: *Nibelungenlied:* Professor Wood. Tuesday, Thursday, and Friday, 10 a. m., Room 4. (10).

Baskett, W. D.
Fowler, T. H.
Hollander, L. M.
Kern, A. A.
Kurrelmeyer, H.
Lyon, C. E.
Rodeffer, J. D.
Roulston, R. B.
Sanderlin, G. B.
Wise, B. A.

Germanic Society: Professor Wood. Alternate Fridays, 4–6 p. m., Room 4. (10).

Baskett, W. D.
Crenshaw, J. B.
Fowler, T. H.
Hofmann, J.
Hollander, L. M.
Kurrelmeyer, H.
Lyon, C. E.
Rodeffer, J. D.
Roulston, R. B.
Sanderlin, G. B.

Gothic: Professor Wood. Wednesday and Friday, 11 a. m., Room 4. (8).

Hollander, L. M.
Kern, A. A.
Kurrelmeyer, H.
Lyon, C. E.
Roulston, R. B.
Sanderlin, G. B.
Smull, M. N.
Stevens, G. L.

Old Saxon: Professor Wood. Tuesday, 9 a. m., Room 3. (3).

Fowler, T. H.
Kurrelmeyer, H.
Lyon, C. E.

History of German Literature: Professor Wood. Wednesday, 10 a. m., Room 4. (5).

Fowler, T. H.
Hollander, L. M.
Kurrelmeyer, H.
Lyon, C. E.
Roulston, R. B.

History of Middle High German Literature: Associate Professor Vos. Thursday and Friday, 9 a. m., Room 6. (6).

Fowler, T. H.
Hollander, L. M.
Kurrelmeyer, H.
Lyon, C. E.
Roulston, R. B.
Sanderlin, G. B.

Literary Relations of England and Germany in the Eighteenth Century: Dr. Baker. Friday, 3 p. m., Room 8. (3).

Hollander, L. M.
Lyon, C. E.
Myers, C. A.

Major Course.

History of German Literature: Associate Professor Vos. Monday; ***Goethe,*** *Faust:* Professor Wood. Tuesday and Thursday; ***Prose Composition:*** Professor Wood and Mr. Hofmann. Friday, 11 a. m., Room 6. (12).

Adler, S. H.
Blanck, F. C.
Bryan, J. W.
Combs, J. M.
Fuerbringer, R. O.
Hazlehurst, F.
Marshall, C. A.
Mower, McH.
Pessagno, E. L.
Sparrow, C. M.
Stubenrauch, C. H.
Tootle, H. K.

Minor Course A.

Prose Composition: Professor Wood. Monday; ***Classics:*** Associate Professor Vos. Tuesday, Thursday, and Friday, 11 a. m. Room 11. (33).

Austrian, C. R.
Baetjer, W. A.
Baldauf, L. D.
Bamberger, E. S.
Bennett, J. L.
Buckler, R.
Cameron, J.
Crozier, W. E.
Dettelbach, P.
Emig, J. W.
Erlanger, S. C.
Geiger, A.
Hawkins, J. C. L.
Kohn, I. H.
Kohn, W. W.
LeCron, W. L.
Lloyd, H. L.
McGlone, J.
Muhly, H. E.
Neal, C. A.
Nicholson, R. J.
Numsen, J. N.
Porter, F. G.
Robinson, C. A.
Rosenfeld, M.
Rosenheim, G. B.
Saylor, C. H.
Schapiro, S. H.
Schwatka, J. B.
Seibels, H. G.
Strouse, J.
Wallis, L. G.
Willis, L. M. R.

Minor Course B.

Whitney, *German Grammar;* ***Buchheim,*** *Elementary Prose Composition;* ***Keller,*** *Kleider machen Leute;* ***Goethe,*** *Egmont:* Dr. Kurrelmeyer. Daily, except Wednesday, 11 a. m., Room 8. (16).

Ammen, W. W.
Bost, J. L.
Gudger, E. W.
Jackson, R. N.
Kodera, K.
MacDonald, W. E.
McKnight, R. J. G.
McPherson, W. B.
Opie, R.
Pearre, S.
Riley, C. W.
Stephens, R. P.
Stollenwerck, F.
Strobhar, T. S.
Wada, I.
Williams, F. R. V.

Elementary German: Associate Professor Vos. Monday, Tuesday, and Thursday, 1 p. m., Room 12. (6).

Cator, B. F.
Cohen, L. S.
Kodera, K.
Matthai, W. H.
Maynard, T. P.
Rutledge, J. J.

Elective Course.

Readings in Contemporary German Literature: *Ebner-Eschenbach, Freiherren v. Gemperlein, Krambambuli; Wildenbruch, Das edle Blut, Der Letzte, Harold; Hauptmann, Die versunkene Glocke:* Dr. Kurrelmeyer. Monday, 4 p. m., Thursday, 12 m., Room 8. (5).

Bond, B. W.
England, J. T.
Myers, J. N.
Putts, B. S.
Seibels, H. G.

Supplementary Courses.

Scientific Readings: *Dippold, Scientific Reader; Helmholtz, Goethe's Naturwissenschaftliche Arbeiten:* Dr. Kurrelmeyer. Monday and Thursday, 5 p. m., Room 8. (18).

Beasley, E. B.
Beeuwkes, H.
Branch, J. R. B.
Buttner, W. J.
Campbell, J. G.
Grasty, J. S.
Hazen, H. H.
Mower, F. D.
Murphy, L. C.
Parsons, W. T.
Pinkerton, T. C.
Rutledge, J. J.
Schaub, I. O.
Schaun, P. E.
Shipley, S. D.
Tennent, D. H.
Tough, L. M.
Twitchell, M. W.

Historical Readings; *Seiler, Die Heimat der Indogermanen; Prehn, Journalistic German:* Dr. Kurrelmeyer. Monday and Thursday, 3 p. m., Room 8. (10).

Bixler, E. C.
Chitwood, O. P.
Clarke, A. H.
Crumley, J. J.
Dodge, A.
Licking, R. S.
Machen, J. G.
Mathews, C. E.
Seibels, H. G.
Shear, T. L.

Oral Exercises: *(For Graduate Students):* Mr. Hofmann. Wednesday, 12 m., Thursday, 11 a. m., Room 10. (8).

Biggs, R. J.
Bond, B. W.
Fowler, T. H.
Kurrelmeyer, H.
Rodeffer, J. D.
Roulston, R. B.
Sanderlin, G. B.
Seibels, H. G.

German Conversation: *(For Undergraduates):* Mr. Hofmann. Monday, 1 p. m., Room 11. (9).

Blanck, F. C.
Campbell, J. G.
Crane, R. T.
Hazlehurst, F.
Hildt, J. C.
Kohn, I. H.
Murkland, W. U.
Tootle, H. K.
Wroth, P.

Romance Languages. (98 Students).

Classes meet in McCoy Hall.

Advanced Courses:

French Seminary: Professor Elliott. Tuesday, 11 a. m.–1 p. m., Room 2. (11).

Biggs, R. J.
Buffum, D. L.
Child, J. A.
Critchlow, F. L.
Curdy, A. E.
Eager, J. H.
Easter, D. B.
Mathews, C. E.
Morrison, A. J.
Peirce, W. T.
Rubenstein, C. A.

French Dialects: Professor Elliott. Monday, 12 m., Room 2. (7).

Biggs, R. J.
Critchlow, F. L.
Curdy, A. E.
Easter, D. B.
Morrison, A. J.
Peirce, W. T.
Rubenstein, C. A.

French Pronunciation; Associate Professor Armstrong. Monday, 9 a. m., Room 2. (8).

Berg, G. O.
Biggs, R. J.
Bond, B. W.
Buffum, D. L.
Larwill, P. H.
Mathews, C. E.
Rodeffer, J. D.
Smull, M. N.

French Syntax: Associate Professor Armstrong. Wednesday and Friday, 9 a. m., Room 2. (10).

Buffum, D. L.
Child, J. A.
Critchlow, F. L.
Curdy, A. E.
Eager, J. H.
Gould, W. E.
Morrison, A. J.
Peirce, W. T.
Rubenstein, C. A.
Stidman, A. G.

French Phonology: Associate Professor Armstrong. Monday and Wednesday, 10 a. m., Friday, 11 a. m., Room 2. (10).

Biggs, R. J.
Bond, B. W.
Buffum, D. L.
Easter, D. B.
Larwill, P. H.
Mathews, C. E.
Peirce, W. T.
Ramsay, R. L.
Rodeffer, J. D.
Smull, M. N.

Romans d'Aventure: Professor F. M. Warren. Twenty lectures, Room 2. (12).

Biggs, R. J.
Buffum, D. L.
Child, J. A.
Critchlow, F. L.
Curdy, A. E.
Eager, J. H.
Easter, D. B.
Keidel, G. C.
Mathews, C. E.
Morrison, A. J.
Peirce, W. T.
Rubenstein, C. A.

French Realists and Naturalists: Professor F. M. Warren. Six public lectures, Donovan Room, 5 p. m. (10).

Biggs, R. J.
Bond, B. W.
Buffum, D. L.
Critchlow, F. L.
Curdy, A. E.
Easter, D. B.
Mathews, C. E.
Morrison, A. J.
Peirce, W. T.
Ramsay, R. L.

Old French Readings: *(Class A):* Dr. Brush. Tuesday and Thursday, 9 a. m., Room 7. (6).

Child, J. A.
Eager, J. H.
Easter, D. B.
Kern, A. A.
Peirce, W. T.
Stevens, G. L.

Old French Readings: *(Class B):* Associate Professor Armstrong. Wednesday, 3 p. m., Room 2. (8).

Berg, G. O.
Biggs, R. J.
Bond, B. W.
Buffum, D. L.
Larwill, P. H.
Mathews, C. E.
Ramsay, R. L.
Rodeffer, J. D.

Popular Latin: Professor Elliott. Monday, 11 a. m., Room 2. (9).

Biggs, R. J.
Buffum, D. L.
Child, J. A.
Curdy, A. E.
Eager, J. H.
Easter, D. B.
Morrison, A. J.
Peirce, W. T.
Rubenstein, C. A.

Dante: Professor Elliott. Wednesday, 12 m., Room 2. (6).

Buffum, D. L.
Child, J. A.
Curdy, A. E.
Eager, J. H.
Mathews, C. E.
Peirce, W. T.

Italian Phonology and Morphology: Dr. Shaw. Tuesday, Thursday, and Friday, 10 a. m., Room 6. (4).

Child, J. A.
Eager, J. H.
Mathews, C. E.
Stidman, A. G.

Italian Literature: Dr. Shaw. Friday, 12 m., Room 2. (7).

Biggs, R. J.
Buffum, D. L.
Child, J. A.
Eager, J. H.
Mathews, C. E.
Peirce, W. T.
Stidman, A. G.

Spanish Seminary: Associate Professor Marden. Friday, 11 a.m., Room 4. (1).

Gould, W. E.

Spanish Philology: Associate Professor Marden. Tuesday and Thursday, 10 a. m., Room 2. (3).

Buffum, D. L.
Easter, D. B.
Peirce, W. T.

Old Spanish Readings: Associate Professor Marden. Friday, 10 a. m., Room 2. (3).

Buffum, D. L.
Easter, D. B.
Ember, A.

Early Spanish Epic: Associate Professor Marden. Thursday, 11 a. m., Room 2. (6).

Buffum, D. L.
Eager, J. H.
Easter, D. B.
Ember, A.
Peirce, W. T.
Rubenstein, C. A.

Romance Palæography: Dr. Keidel. Thursday, 12 m., Room 2. (5).

Biggs, R. J.
Buffum, D. L.
Easter, D. B.
Mathews, C. E.
Peirce, W. T.

Romance Club: Professor Elliott. Wednesday, 11 a. m., Room 2. (12).

Biggs, R. J.
Buffum, D. L.
Child, J. A.
Critchlow, F. L.
Curdy, A. E.
Eager, J. H.
Easter, D. B.
Gould, W. E.
Mathews, C. E.
Morrison, A. J.
Peirce, W. T.
Rubenstein, C. A.

French: (*Elementary Course for Graduate Students*): Dr. Brush. Monday and Thursday, 11 a. m., Room 7; Tuesday, 11 a. m., Room 10. (7).

Clarke, A. H.
Doughty, H. W.
Graff, M. B.
Hollis, P.
Seiple, W. G.
Shoemaker, D. N.
Wright, J. M.

Undergraduate Courses:

French: (*Major Course*): Dr. Brush. Daily, except Tuesday, 10 a. m., Room 7. (8).

Buttner, W. J.
Haughton, J. A.
Hazlehurst, F.
Hildebrandt, L. F.
Marbury, O.
Matthai, W. H.
Myers, C. A.
Strouse, E.

French: (*Minor Course A*): Dr. Brush. Daily, except Thursday, 12 m., Room 7. (23).

Addison, J. A.
Adelsdorf, L.
Ammen, W. W.
Baldauf, A. N.
Branch, J. R. B.
Campbell, J. G.
Dochez, A. R. V.
Glocker, T. W.
Grasty, J. S.
Hildt, J. C.
Hopper, S. C.
Humrichouse, H. H.
Iglehart, F. N.
Jackson, R. N.
Licking, R. S.
Ogle, M. B.
Plaggemeyer, H. W.
Straus, H. P.
Strayer, G. D.
Tough, L. M.
Treide, H. C.
Warner, H. A.
Winternitz, M. C.

French: (*Minor Course B*): Mr. Critchlow. Daily, except Thursday, 12 m., Room 6. (11).

Adler, S. H.
Custis, J. B. G.
Dew, A. G.
Hand, J. P.
Mower, McH.
Nicholson, R. J.
Pagon, R. C.
Smith, J. T.
Snowden, W.
Tootle, H. K.
Yearley, A.

French: (*Elective Course*): Mr. Critchlow. Monday, 9 a. m., Tuesday, 10 a. m., Room 8. (13).

Bernheim, E. P.
Booker, J. M.
Diggs, R. M.
Hill, W. B.
Marshall, C. A.
Mower, F. D.
Myers, J. N.
Pels, I. R.
Putts, B. S.
Stone, H. B.
Strouse, S.
Toms, K. S.
Wroth, P.

Spanish: (*Minor Course*): Associate Professor Marden. Daily, except Monday, 9 a. m., Room 8. (4).

Biggs, R. J.
Hazen, H. H.
Hildebrandt, L. F.
Mathews, C. E.

Spanish: (*Elective Course*): Associate Professor Marden. Monday, 9 a. m., Thursday 12 m., Room 10. (7).

McGlone, B.
Moore, R. E.
Pearre, A.
Sayler, J. A.
Sharretts, R. C.
Slemons, J. A.
Smith, S.

Spanish Conversation : Mr. Gould. Monday, 5 p. m., Room 2. (4).

Biggs, R. J.
Buffum, D. L.
Mathews, C. E.
Peirce, W. T.

Italian: (*Minor Course*): Dr. Shaw. Daily, except Monday, 9 a. m., Room 10. (6).

Haughton, J. A.
Larwill, P. H.
Myers, C. A.
Pels, I. R.
Stone, H. B.
Strouse, S.

Italian: (*Elective Course*): Dr. Shaw. Monday and Friday, 1 p. m., Room 7. (7).

Crane, R. T.
Cross, H. I.
Easter, D. B.
Macht, D. I.
Mathews, C. E.
Mood, J. R.
Wolman, S.

Italian Conversation: Mr. Oussani. Friday, 2 p. m., Room 2. (4).

Ammen, W. W.
Drenford, G.
Larwill, P. H.
Stidman, A. G.

History, Politics, and Economics. (111 Students).

Classes meet in McCoy Hall.

Historical and Political Science Association: Associate Professor Vincent. Alternate Fridays, 8 p. m., Room 25. (20).

Benton, E. J.
Bledsoe, J. F.
Bost, J. L.
Boyer, N.
Cator, G.
Chitwood, O. P.
Crumley, J. J.
Eckenrode, H. J.
Garrett, R.
Harry, J. W.
Hattori, Y.
Hollis, P.
Kodera, K.
Moore, J. S.
Moore, T. B.
Sommerville, C. W.
Stubbs, T. J.
White, J. M.
Wright, J. M.
Wright, R. H.

German Reformation: Associate Professor Vincent. Monday and Tuesday, 10 a. m., Room 25. (16).

Benton, E. J.
Bledsoe, J. F.
Bost, J. L.
Boyer, N.
Chitwood, O. P.
Eckenrode, H. J.
Harry, J. W.
Hattori, Y.
Hollis, P.
Kodera, K.
Moore, J. S.
Moore, T. B.
Stubbs, T. J.
White, J. M.
Wright, J. M.
Wright, R. H.

English Reformation: Associate Professor Vincent. Wednesday and Thursday, 10 a. m., Room 25. (17).

Benton, E. J.
Bledsoe, J. F.
Bost, J. L.
Boyer, N.
Chitwood, O. P.
Crumley, J. J.
Eckenrode, H. J.
Harry, J. W.
Hattori, Y.
Hollis, P.
Kodera, K.
Moore, J. S.
Moore, T. B.
Stubbs, T. J.
White, J. M.
Wright, J. M.
Wright, R. H.

Historical Conference: Associate Professor Vincent. Friday, 10 a. m., Room 23. (14).

Benton, E. J.
Bledsoe, J. F.
Bost, J. L.
Boyer, N.
Chitwood, O. P.
Crumley, J. J.
Eckenrode, H. J.
Harry, J. W.
Hollis, P.
Kodera, K.
Moore, J. S.
Moore, T. B.
Stubbs, T. J.
White, J. M.

American Colonial History: Dr. Ballagh. Friday, 11 a. m., Room 23. (10).

Benton, E. J.
Bost, J. L.
Boyer, N.
Chitwood, O. P.
Eckenrode, H. J.
Harry, J. W.
Hollis, P.
Moore, T. B.
Stubbs, T. J.
Wright, R. H.

Southern History: Dr. Ballagh. Thursday, 11 a. m., Room 23. (10).

Benton, E. J.
Bost, J. L.
Boyer, N.
Chitwood, O. P.
Eckenrode, H. J.
Harry, J. W.
Hollis, P.
Moore, T. B.
Stubbs, T. J.
Wright, R. H.

Oral Examinations in General History: Dr. Ballagh. Wednesday, 11 a. m., Room 24. (4).

Benton, E. J.
Harry, J. W.
Hattori, Y.
Stubbs, T. J.

Civilization and Politics in the East: (*Major History*): Dr. Ballagh. Monday and Tuesday, 11 a. m., Room 24. (22).

Addison, J. A.
Adelsdorf, L.
Baetjer, H. N.
Baldauf, A. N.
Bird, W. S.
Blum, S.
Glocker, T. W.
Haughton, J. A.
Hildt, J. C.
Hopper, S. C.
Hunley, W. M.
Iglehart, F. N.
Lanier, R. S.
Myers, J. N.
Nelson, J. M.
Pagon, R. C.
Parsons, W. T.
Sandrock, E. P.
Snowden, W.
Strayer, G. D.
Toms, K. S.
Yearley, A.

European History: (*Major History*): Dr. Barnett. Thursday and Friday, 11 a. m., Room 24. (22).

Addison, J. A.
Adelsdorf, L.
Baetjer, H. N.
Baldauf, A. N.
Bird, W. S.
Blum, S.
Glocker, T. W.
Haughton, J. A.
Hildt, J. C.
Hopper, S. C.
Hunley, W. M.
Iglehart, F. N.
Lanier, R. S.
Myers, J. N.
Nelson, J. M.
Pagon, R. C.
Parsons, W. T.
Sandrock, E. P.
Snowden, W.
Strayer, S. D.
Toms, K. S.
Yearley, A.

Classical and Early European History: (*Minor Course*): Dr. Ballagh. Daily, except Tuesday, 10 a. m., Room 23. (18).

Bennett, J. L.
Crozier, W. E.
Dulany, R. G.
Erlanger, S. C.
Foster, G. A.
Geiger, A. L.
Humrichouse, H. H.
Lloyd, H. L.
McGlone, J.
Mower, McH.
Muhly, H. E.
Pearre, S.
Pinkerton, T. C.
Rosenfeld, M.
Rosenheim, G. B.
Schapiro, S. H.
Stollenwerck, F.
Willis, L. M. R.

Economic Seminary: Associate Professor Hollander and Dr. Barnett. Alternate Tuesdays, 8 p. m. (13).

Bost, J. L.
Boyer, N.
Cator, G.
Del Valle, F.
Hanna, H. S.
Hattori, Y.
Hollis, P.
James, B. B.
Kodera, K.
Moore, T. B.
Rayner, A. W.
Wingert, M.
Wright, J. M.

Theory and Practice of Finance: Associate Professor Hollander. Tuesday and Wednesday, 9 a. m., Room 24. (15).

Benton, E. J.
Bost, J. L.
Boyer, N.
Cator, G.
Chitwood, O. P.
Del Valle, F.
Hattori, Y.
Hollis, P.
James, B. B.
Kodera, K.
Moore, T. B.
Rayner, A. W.
Stubbs, T. J.
Wingert, M.
Wright, J. M.

Development of Economic Theories since Adam Smith: Associate Professor Hollander. Thursday and Friday, 9 a. m., Room 24. (15).

Benton, E. J.
Bost, J. L.
Boyer, N.
Cator, G.
Chitwood, O. P.
Del Valle, F.
Harry, J. W.
Hattori, Y.
Hollis, P.
James, B. B.
Kodera, K.
Moore, T. B.
Rayner, A. W.
Stubbs, T. J.
Wright, J. M.

Elements of Statistics: Dr. Barnett. Monday, 9 a. m., Room 23. (9).

Benton, E. J.
Boyer, N.
Cator, G.
Harry, J. W.
Hattori, Y.
Hollis, P.
Moore, T. B.
Rayner, A. W.
Wright, J. M.

Recent Economic Theories: (*Undergraduate Elective*): Associate Professor Hollander. Thursday, 12 m., Friday, 1 p. m., Room 21. (10).

Del Valle, F.
Diggs, R. M.
Guggenheimer, F. L.
Hill, W. B.
Kirk, W.
Marbury, O.
Markell, C.
Moore, T. B.
Ranft, C. F.
Schmeisser, W. C.

Elements of Economics: (*Minor Economics and History-Economics Course*): Dr. Barnett. Thursday and Friday, 10 a. m., Room 24. (47).

Adelsdorf, L.
Baetjer, H. N.
Baldauf, A. N.
Bamberger, E. S.
Beasley, E. B.
Bird, W. S.
Blanck, F. C.
Blum, S.
Bruner, L. U.
Bryan, J. W.
Del Valle, F., Jr.
Dew, A. G.
England, J. T.
Gillespie, H. C.
Glocker, T. W.
Hildt, J. C.
Hoffman, R. C.
Hunley, W. M.
Koppelman, W. H.
Lanier, R. S.
Licking, R. S.
Macht, D. I.
Marshall, C. A.
McGlone, B.
Moore, R. E.
Myers, J. N.
Nelson, J. M.
Ogle, M. B.
Pagon, R. C.
Pearre, A.
Pessagno, E. L.
Plaggemeyer, H. W.
Powell, M. W.
Reynolds, W. F.
Sandrock, E. P.
Sayler, J. A.
Sisco, G. E.
Snowden, W.
Straus, P. R.
Stubenrauch, C. H.
Tootle, H. K.
Treide, H. E.
Warner, H. A.
Winternitz, M. C.
Wolman, S.
Wroth, P.
Yearley, A.

Economic History of the United States: (*Minor Economics*): Dr. Barnett. Monday and Wednesday, 10 a. m., Room 20. (19).

Adelsdorf, L.
Baetjer, H. N.
Baldauf, A. N.
Beasley, E. B.
Bird, W. S.
Blum, S.
Del Valle, F., Jr.
Eogland, J. T.
Glocker, T. W.
Hildt, J. C.
Hunley, W. M.
Lanier, R. S.
Myers, J. N.
Pagon, R. C.
Pearre, A.
Sayler, J. A.
Snowden, W.
Tootle, H. K.
Yearley, A.

Historical Politics: (*History-Economics Course*): Dr. Steiner. Monday and Wednesday, 10 a. m., Room 24. (28).

Bamberger, E. S.
Blanck, F. C.
Bruner, L. U.
Bryan, J. W.
Dew, A. G.
Gillespie, H. C.
Hoffman, R. C.
Koppelman, W. H.
Licking, R. S.
Macht, D. I.
Marshall, C. A.
McGlone, B.
Moore, R. E.
Nelson, J. M.
Ogle, M. B.
Pessagno, E. L.
Plaggemeyer, H. W.
Powell, M. W.
Reynolds, W. F.
Sandrock, E. P.
Sisco, G. E.
Straus, P. R.
Stubenrauch, C. H.
Treide, H. E.
Warner, H. A.
Winternitz, M. C.
Wolman, S.
Wroth, P.

Legal Aspects of Economic and Industrial Problems: Associate Professor Willoughby. Wednesday and Thursday, 12 m., Room 20. (15).

Beoton, E. J.
Boyer, N.
Bost, J. L.
Cator, G.
Chitwood, O. P.
Hanna, H. S.
Hattori, Y.
Hollis, P.
Kodera, K.
Moore, J. S.
Moore, T. B.
Raffel, H. B.
Stubbs, T. J.
Wingert, M.
Wright, J. M.

History of Political Theories since 1750: Associate Professor Willoughby. Monday and Tuesday, 12 m., Room 20. (13).

Benton, E. J.
Boyer, N.
Bost, J. L.
Cator, G.
Chitwood, O. P.
Hanna, H. S.
Kodera, K.
Moore, J. S.
Moore, T. B.
Raffel, H. B.
Stubbs, T. J.
White, J. M.
Wright, J. M.

Political Conference: Associate Professor Willoughby. Alternate Wednesdays, 3.30 p. m., Room 20. (9).

Benton, E. J.
Bost, J. L.
Cator, G.
Kodera, K.
Moore, J. S.
Moore, T. B.
Raffel, H. B.
Stubbs, T. J.
Wright, J. M.

American Constitutional Law and History: (*Major Politics*): Dr. Steiner. Tuesday and Friday, 12 m., Room 24. (17).

Cameron, J.
Diggs, R. M.
England, J. T.
Guggenheimer, F. L.
Harry, J. W.
Hill, W. B.
Kirk, W.
Marbury, O.
Markell, C.
Murphy, L. C.
Myers, J. N.
Pearre, A.
Ranft, C. F.
Sayler, J. A.
Schmeisser, W. C.
Sharretts, R. C.
Smith, S.

English History and Constitutional Law: (*Major Politics*): Dr. Lee. Monday and Wednesday, 12 m., Room 24. (15).

Cameron, J.
Diggs, R. M.
England, J. T.
Guggenheimer, F. L.
Hill, W. B.
Kirk, W.
Marbury, O.
Murphy, L. C.
Pearre, A.
Ranft, C. F.
Sayler, J. A.
Schmeisser, W. C.
Sharretts, R. C.
Smith, S.
Strouse, E.

Introduction to the Study of Law: Dr. Lee. Wednesday, 9 a. m., Room 23. (15).

Adelsdorf, L.
Diggs, R. M.
England, J. T.
Hill, W. B.
Hoffman, R. C.
Kirk, W.
Murphy, L. C.
Pagon, R. C.
Pearre, A.
Rauft, C. F.
Sayler, J. A.
Sharretts, R. C.
Sisco, G. E.
Smith, S.
Tootle, H. K.

Charitable Legislation and Custom: Dr. Brackett. Wednesday, 2 p. m., Room 23. (3).

Addison, J. A.
Wright, R. H.
Wroth, P.

Commercial Relations of the United States and Germany: Dr. G. M. Fisk. Monday, 11 a. m., Room 23. (6).

Benton, E. J.
Harry, J. W.
Moore, T. B.
Stubbs, T. J.
White, J. M.
Wingert, M.

Philosophy. (55 Students).

Classes meet in Room 12, McCoy Hall.

Modern Ethical Theories: Professor Griffin. Alternate Mondays, 3 p. m. (5).

Clarke, A. H.
Moore, J. S.
Sanderlin, G. B.
Schneider, J. P.
Wright, R. H.

History of Philosophy: (*For Graduate Students*): Professor Griffin. Friday, 3 p. m. (8).

Clarke, A. H.
Cross, H. I.
Eckenrode, H. J.
Ember, A.
Moore, J. S.
Routh, J. E.
Sanderlin, G. B.
Wright, R. H.

Deductive and Inductive Logic: (until December 20); ***Psychology:*** (January 6 to March 26); ***Ethics:*** (after April 2): Professor Griffin. Daily, 11 a. m. ***Outlines of the History of Philosophy.*** Weekly. (46).

Beasley, E. B.
Beeuwkes, H.
Bernheim, E. P.
Bruner, L. U.
Buttner, W. J.
Campbell, J. G.
Crane, R. T.
Dew, A. G.
Diggs, R. M.
England, J. T.
Gillespie, H. C.
Guggenheimer, F. L.
Hand, J. P.
Hazen, H. H.
Hildebrandt, L. F.
Hill, E. C.
Hill, W. B.
Hoffman, W. E.
Kirk, W.
Koppelman, W. H.
Macht, D. I.
Marbury, O.
Markell, C.
McGlone, B.
Moore, R. E.
Murphy, L. C.
Myers, C. A.
Ogle, M. B.
Pearre, A.
Pels, I. R.
Pinkerton, T. C.
Putts, B. S.
Rauft, C. F.
Reynolds, W. F.
Sayler, J. A.
Schmeisser, W. C.
Sharretts, R. C.
Shippen, L. P.
Sisco, G. E.
Slemons, J. A.
Smith, S.
Stone, H. B.
Straus, H. P.
Strouse, S.
Wolman, S.
Wroth, P.

Drawing. (46 Students).

Classes meet in the Howard Street Building, Room 18.

Freehand Drawing: Mr. Whiteman. Tuesday and Thursday, 2–5 p. m. (41).

Austrian, C. R.
Baldauf, L. D.
Baetjer, W. A.
Bennett, J. L.
Branham, H. G.
Buckler, R.
Cator, B. F.
Cohen, L. S.
Combs, J. M.
Crozier, W. E.
Dettelbach, P.
Dulany, R. G.
Emig, J. W.
Erlanger, S. C.
Fuerbringer, R. O.
Foster, G. A.
Geiger, A.
Hawkins, J. C. L.
Jackson, R. N.
Kohn, I. H.
Kohn, W. W.
LeCron, W. L.
Lloyd, H. L.
Louis, H. C. E.
Maynard, T. P.
McGlone, J.
Muhly, H. E.
Neal, C. A.
Numsen, J. N.
Opie, R.
Pearre, S.
Porter, F. G.
Rosenfeld, M.
Rosenheim, G. B.
Rosenthal, M. W.
Schapiro, S. H.
Schwatka, J. B.
Stollenwerck, F.
Strobhar, T. S.
Wallis, L. G.
Wayson, N. E. W.

Special Course: Mr. Whiteman. Tuesday and Thursday, 2–5 p. m. (5).

Bruner, L. U.
Gutman, E. J.
Hopper, S. C.
Schmeisser, E. G.
Sisco, G. E.

Public Speaking. (141 Students).

Classes meet in McCoy Hall.

Parliamentary Practice: (*Senate*): Dr. Lee. Donovan Room, Alternate Wednesdays, 11 a. m. (47).

Beasley, E. B.
Bernheim, E. P.
Booker, J. M.
Bruner, L. U.
Buttner, W. J.
Campbell, J. G.
Dew, A. G.
Diggs, R. M.
England, J. T.
Gillespie, H. C.
Grasty, J. S.
Guggenheimer, F. L.
Hand, J. P.
Hazen, H. H.
Hildebrandt, L. F.
Hill, E. C.
Hill, W. B.
Kirk, W.
Koppelman, W. H.
Marbury, O.
Markell, C.
McGlone, B.
Moore, R. E.
Mower, McH.
Murphy, L. C.
Myers, C. A.
Ogle, M. B.
Pearre, A.
Pels, I. R.
Pinkerton, T. C.
Putts, B. S.
Ranft, C. F.
Reynolds, W. F.
Sayler, J. A.
Schmeisser, W. C.
Sharretts, R. C.
Sisco, G. E.
Slemons, J. A.
Smith, S.
Snively, H. N.
Stone, H. B.
Straus, H. P.
Strouse, E.
Strouse, S.
Wolman, S.
Wroth, P.

Parliamentary Law: *Second Year* (*House of Representatives*): Dr. Lee. Thursday, 12 m., Donovan Room. (48).

Addison, J. A.
Adelsdorf, L.
Adler, S. H.
Ammen, W. W.
Baetjer, H. N.
Baldauf, A. N.
Bamberger, E. S.
Bird, W. S.
Blanck, F. C.
Blum, S.
Bryan, J. W.
Combs, J. M.
Custis, J. B. G.
Glocker, T. W.
Haughton, J. A.
Hazlehurst, F.
Hendry, M. W.
Hildt, J. C.
Hoffman, R. C.
Hopper, S. C.
Hunley, W. M.
Lanier, R. S.
Marshall, C. A.
Meeks, B. W.
Murkland, W. U.
Nelson, J. M.
Pagon, R. C.
Parsons, W. T.
Pessagno, E. L.
Plaggemeyer, H. W.
Riley, C. W.
Robinson, C. A.
Sandrock, E. P.
Schmeisser, E. G.
Smith, J. T.
Snowden, W.
Sparrow, C. M.
Straus, P. R.
Strayer, G. D.
Stubenrauch, C. H.
Toms, K. S.
Tootle, H. K.
Townsend, G. W.
Treide, H. E.
Warner, H. A.
Williams, F. R. V.
Winternitz, M. C.
Yearley, A.

Public Speaking: (*Advanced Course*): Dr. Lee. Wednesday, 5 p. m., Assembly Room, McCoy Hall. (24).

Austrian, C. R.
Bennett, J. L.
Branch, J. R. R.
Branham, H. G.
Buckler, R.
Cator, B. F.
Del Valle, F., Jr.
Emig, J. W.
Foster, G. A.
Geiger, A. L.
Gutman, E. J.
Hawkins, J. C. L.
Humrichouse, H. H.
Licking, R. S.
Lloyd, H. L.
Louis, H. C. E.
McGlone, J.
Opie, R. S.
Rosenfeld, M.
Rosenheim, G. B.
Schapiro, S. H.
Stollenwerck, F.
Strobhar, T. S.
Wallis, L. G.

Elements of Public Speaking: Dr. Lee and Mr. Thomas. Assembly Room, McCoy Hall.

Wednesday, 1 p. m. (15).

Austrian, C. R.
Branham, H. G.
Buckler, R.
Cator, B. F.
Emig, J. W.
Hawkins, J. C. L.
Louis, H. C. E.
Mohly, H. E.
Opie, R. S.
Porter, F. G.
Rosenheim, G. B.
Schwatka, J. B.
Wallis, L. G.

Thursday, 1 p. m. (15).

Baetjer, W. A.
Branch, J. R. B.
Crozier, W. E.
Erlanger, S. C.
Fuerbringer, R. O.
Gutman, E. J.
Kohn, W. W.
LeCron, W. L.
Licking, R. S.
Maynard, T. P.
Numsen, J. N.
Pearre, S.
Strouse, J.
Wayson, N. E. W.
Willis, L. M. R.

Friday, 1 p. m. (16).

Bennett, J. L.
Cohen, L. S.
Dulany, R. G.
Foster, G. A.
Geiger, A. L.
Haughton, H. A.
Humrichouse, H. H.
Lloyd, H. L.
McGlone, J.
Neal, C. A.
Rosenfeld, M.
Rosenthal, M. W.
Saylor, C. H.
Schapiro, S. H.
Stollenwerck, F.
Strobhar, J. S.

STUDENTS IN THE JOHNS HOPKINS MEDICAL SCHOOL.

Candidates for the Degree of M. D. (225).

Fourth Year. (58).

Auer, J.
Briggs, J. B.
Browne, B. B.
Bruns, R. M.
Bryan, W. M. C.
Bush, C.
Churchman, J. W.
Clarke, T. W.
Cook, H. W.
Coons, J. J.
Dohme, G. C.
Dolley, D. H.
Duffy, R.
Dunlop, J.
Eddy, D. L.
Erving, W. G.
Ferry, N. S.
Foster, N. B.
Francis, W. W.
Frankenthal, M. A.
Glenny, W. H.
Hardy, C. F.
Haviland, M. L.
Haynes, M. S.
Hirshberg, L. K.
Horst, C. H.
Hyman, S.
Jelke, W. F.
Jones, T. M.
Karsted, A.
Kimball, A. H.
Lehr, L. C.
L'Engle, E. M.
Litchfield, G. V.
Lootz, E.
Ludlum, S. D.
Lyle, A. G.
MacGregor, G. M.
Marshall, S. A.
McFarland, J. S.
Meisenhelder, E. W.
Meisenhelder, J. E.
Ochsner, H. W.
Reede, E. H.
Riggins, E. N.
Rogers, C. P.
Rushmore, S.
Scholl, G. B.
Silverberg, M.
Simpson, J. N.
Steele, H. M.
Tallant, A. W.
Van Arsdall, G. B.
Van Denburgh, J.
Wight, O. B.
Williams, C. L.
Williams, D.
Wright, C. B.

Third Year. (51).

Bassett, V. H.
Bixler, L. C.
Blauvelt, E. H.
Brem, W. V., Jr.
Brush, C. E., Jr.
Chatard, J. A.
Chinn, G. E., Jr.
Clark, A. H.
Cornell, W. B.
Dewey, E. G.
Dudley, H.
Edwards, R. T.
Fayerweather, R.
Fischer, J. S.
Gaenslen, F. J.
Gaines, L. McF.
Geraghty, J. T.
Goldsborough, F. C.
Grant, J. F.
Haskell, L. W., Jr.
Hirschfelder, A.D.
Hopkins, R.
Hutchins, H. T.
Jones, C. L.
Jones, L. T.
Keidel, A.
Lazenby, M.
Loevenhart, A. S.
Long, H. D.
Long, M.
Lupton, E. J. S.
Lynch, L. A.
Manning, W. S.
Marshall, W.
Miller, R. T., Jr.
Morse, M. E.
Moulton, W. B.
Neagle, H. B.
Rainforth, S. I.
Riggs, T. F.
Riley, B. F., Jr.
Robinson, G. C.
Rucker, M. P.
Schmitter, F.
Schultz, O. T.
Smith, W. H
Stevens, A. R.
Thompson, W. L.
Travis, C. H.
Watson, F. H.
Young, C. W.

Second Year. (45).

Bacon, J. H.
Baker, T.
Bean, R. B.
Bergland, J. M.
Bonta, M. B.
Caldwell, J. A., Jr.
Carr, J. R.
Casler, D. B.
Egdahl, A.
Garwood, H. G.
Giffin, H. Z.
Greenbaum, H. S.
Hemenway, J.
Kellogg, W. R.
Knowles, L.
Lee, K. J.
Love, J. M.
Manwaring, W. H.
Marshall, H. W.
McCarty, W. C.
McGouldrick, E.C.
Morgan, L. S.
Morrison, J. F.
Nelson, N. O.
Pillow, H. F.
Randolph, J. H.
Reed, J. V.
Remsen, C. M.
Ricker, W. G.
Rosencrantz, E.
Rous, F. P.
Sachs, E.
Schell, O. H.
Stone, H. R.
Storrs, H. J.
Taneyhill, G.L., Jr.
Terry, B. T.
Tyler, G. T.
Vogeler, W. J.
Washburn, R. G.
Weaver, L. S.
Willock, J. S.
Wilson, W. S.
Wilson, W.
Woolverton, H.

First Year. (71).

Abercrombie, R.T.
Baer, C. A.
Baldauf, L K.
Ballou, A. M.
Beeson, M. A.
Bernheim, B. M.
Briscoe, J. S.
Constantine, K.W.
Cowles, C. D., Jr.
Cutter, W. D.
Danforth, M. S.
Dascombe, O. L.
Davenport, H. I.
Davidson, H. J.
Davis, A. W.
Dodds, S. A.
Dowman, C. E., Jr.
Eyster, J. A. E.
Faris, C. M.
Ford, F. R.
Freeman, A. W.
Gilman, P. K.
Grier, S. M
Hale, E.
Hall, F. J.
Haller, J. T.
Hempstead, H.
Hengerer, L.
Hepburn, N. T.
Hill, P. S.
Hooker, D. R.
Houghton, E.
Houghton, H. S.
Lankford, H. M.
Lawson, G. B.
Leopold, E. J.
Marine, D.
Martelle, H. A.
McDonald, A. L.
Mehard, W. McJ.
Meyer, A. W.
Moseley, B. O.
Moss, W. L.
Mumford, E. B.
Paullin, J. E., Jr.
Post, A. L.
Rehberger, G. E.
Rhea, L. J.
Richardson, E. H.
Ricksher, C.
Rindlaub, M. P., Jr.
Risher, F. O.
Robinson, E. H.
Schloss, O. M.
Slocum, R. B.
Smead, L. F.
South, W. H.
Stone, C. W.
Stone, M. L.
Towles, C. B.
Tuttle, L.
Vander Hoof, D.
Van Voast, R. A.
Ward, E. H. P.
Whipple, G. H.
Wiel, H. I.
Williams, H. G.
Winn, N. L.
Wright, T. M., Jr.
Young, F. L.
Youtz, H. L.

PHYSICIANS ATTENDING SPECIAL COURSES. (51).

Allen, S. H.
Anderson, L. G.
Ball, C. R.
Ballard, G. C.
Ballou, P. V.
Baumgarten, W.
Bayne, F. C.
Beall, K. H.
Becher, A. V.
Blesh, A. L.
Burnham, F.W.E.
Burrow, T.
Butterfield, E. H.
Carman, R. D.
Castle, S. A.
Cone, C.
Debenham, A.
Dixon, T. B.
Dobyns, F.
Fifield, E. W.
Fisher, A. L.
Fitzhugh, H. M.
Fox, F.
Graham, H. B.
Hall, A. B.
Hoffman, A.
Hudson, W. H.
Jones, M.
Jones, T. K.
Kirby, F. J.
Klotz, B. J.
Lathrop, R. W.
MacMurchy, H.
MacNevin, M. G.
McLaren, J. M.
McNett, G. C.
Metzler, V. W.
Middleton, G. W.
Mitchell, A., Jr.
Page, R. S.
Rankin, W S.
Read, H. M.
Snow, W. F.
Stowell, J. M.
Threme, A. D. H.
Turner, J.
Wessels, F. H.
White, R. J.
Wholey, N. C.
Wilson, A. A.
Wilson, G.

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PUBLIC MEETINGS, ETC., RECENTLY HELD IN THE UNIVERSITY BUILDINGS.

Fourth annual Teachers' Institute of Baltimore county, in McCoy Hall, September 9, 10, 11.

Reception by the Young Men's Christian Association of the University, in Levering Hall, September 30.

National Rivers and Harbors Congress, in McCoy Hall, October 8, 9.

Annual public meeting of the Charity Organization Society of Baltimore, in McCoy Hall, November 16.

Annual meeting of the Baltimore Society of the Archaeological Institute of America, in the Donovan Room, November 18.

Meetings of the Maryland Folk-Lore Society, in the Donovan Room, November 22, January 31, February 28, April 4.

Reception and banquet by the Presbyterian Union of Maryland, in honor of the members of the "Committee on Revision," then in session in Washington, in McCoy Hall, December 10.

University social receptions,—in the Donovan Room, December 17, and in the physiological building of the Medical School, January 25.

Meetings of the Municipal Art Society of Baltimore, in McCoy Hall, with illustrated lectures by Mr. John M. Carrère, on "Park Extension," and Mr. Albert Kelsey, on "The City of the Future," January 8; by Mr. C. H. Benjamin, on "Smoke Prevention," and Mr. Leslie W. Miller, on "Arts and Crafts," February 26.

Lectures in McCoy Hall, under the auspices of the Archæological Institute of America, by Miss Harriet A. Boyd, of Smith College, on "American Excavations in Crete," January 17; by the Rev. Walter Lowrie, on "Sincerity in Religious Art," February 10; by Professor F. W. Kelsey, of the University of Michigan, on "Excavations at Pompeii, 1892–1901," March 15.

Meeting of the Maryland Public Health Association, with addresses by Dr. Vincent Y. Bowditch, of Boston, and Professor Osler, on the "Treatment of Tuberculosis," in McCoy Hall, January 28.

Annual public debate between members of the Senior and Junior classes, with public speaking by Freshmen, in McCoy Hall, February 27.

Meeting of the Kindergarten Association of Baltimore, with a lecture by Miss Susan E. Blow, and an address by Mr. J. H. Van Sickle, Superintendent of Public Schools, in McCoy Hall, March 4.

Public debate between undergraduates representing this University and the University of North Carolina, in McCoy Hall, March 13.

Reception by the Young Men's Christian Association of the University, in Levering Hall, March 14.

MR. MALCOLM MORRIS, F. R. C. S., of London, gave an address before the Johns Hopkins Medical School on the evening of Wednesday, October 2. His subject was the "Endowment of Medicine."

A course of six lectures on "Public Speaking" was delivered by Mr. SAMUEL A. KING, M. A., of the University of London, in McCoy Hall, at 5 p. m., November 4, 6, 11, 13, 15, 18.

Mr. King also gave a public recital of selections from the plays of Shakespeare in McCoy Hall, on the evening of November 7.

Sir ROBERT STAWELL BALL, LL. D., F. R. S., Lowndean Professor of Astronomy and Geometry in the University of Cambridge and Director of the Cambridge Observatory, gave an illustrated lecture in McCoy Hall, Saturday, November 30, at 8 p. m. His subject was "Time and Tide."

FREDERICK M. WARREN, Ph. D., Professor of Romance Languages in Yale University, gave six lectures on "The French Realists and Naturalists of the Nineteenth Century," beginning Monday, December 9. The topics were:—Beginnings of Realism—Stendhal, Mérimée; Balzac; Flaubert and Naturalism; The De Goncourts; Daudet; Zola; Guy de Maupassant; Loti.

Dr. WILLIAM H. TOLMAN, Secretary of the League for Social Service and Director of the New York Museum of Social Economy, gave an illustrated lecture on "Social and Industrial Betterment," in McCoy Hall, December 20, at 8 p. m. This lecture was provided for by The Woman's Club of Roland Park.

Professor LÉOPOLD MABILLEAU, Corresponding Member of the Institute of France and Director of the "Musée Social de Paris," gave a lecture, in French, before the University, in McCoy Hall, March 14, at 4 p. m. His subject was "L'Ouvrier Français."

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HOURS FOR LECTURES AND RECITATIONS, SECOND HALF-YEAR, 1901-1902.

HOURS.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.
A. M. 9	Differential Equations. (Cohen.) Carbon Compounds. (Remsen.) English Literature. (Greene.) Calculus: Minor. (Hulburt.) Solid and Anal. Geometry. (Hun.) Mechanics. (Ames.) Spanish Elective. (Marden.) French: Elective. (Critchlow.) French Pronunciation. (Armstrong.) Statistics. (Barnett.) Arabic: Elem. (Blake.)	Geometry. (Morley.) Carbon Compounds. (Remsen.) Chem.: Minor. (Renouf and Waters.) Chemistry: Major. (Gilpin.) Latin Composition. (Guernsey.) Projective Geometry, etc. (Hulburt.) Biology: Major. (Andrews & Johnson.) Mechanics. (Ames.) Old Saxon. (H. Wood.) Spanish: Minor. (Marden.) Roman Literature. (Smith.) Old French Readings. (Brush.) Finance. (Hollander.) Aristotle's Ethics. (Miller.) Hebrew Conversation. (Rosenau.) Italian: Minor. (Shaw.)	Geometry. (Morley.) Carbon Compounds. (Remsen.) Chem.: Minor. (Renouf and Waters.) Chemistry: Major. (Gilpin.) Horace. (Guernsey.) Projective Geometry, etc. (Hulburt.) Biology: Major. (Andrews & Johnson.) Mechanics. (Ames.) Introduction to Law. (Lee.) Spanish: Minor. (Marden.) French Syntax. (Armstrong.) Finance. (Hollander.) Latin Readings: Adv. (Wilson.) Italian: Minor. (Shaw.)	Kinematics. (Morley.) Inorganic Chemistry: Adv. (Morse.) Chem.: Minor. (Renouf and Waters.) Chemistry: Major. (Gilpin.) Horace. (Guernsey.) Projective Geometry, etc. (Hulburt.) Biology: Major. (Andrews & Johnson.) Applied Electricity. (Whitehead.) Middle High German. (Vos.) Spanish: Minor. (Marden.) Geol. Journal Club. (Clark and Reid.) Old French Readings. (Brush.) Economic Theories. (Hollander.) Aristotle's Ethics. (Miller.) Post-Biblical Hebrew. (Rosenau.) Italian: Minor. (Shaw.)	Kinematics. (Morley.) Inorganic Chemistry: Adv. (Morse.) Chem.: Minor. (Renouf and Waters.) Chemistry: Major. (Gilpin.) Horace. (Guernsey.) Projective Geometry, etc. (Hulburt.) Biology: Major. (Andrews & Johnson.) Applied Electricity. (Whitehead.) Middle High German. (Vos.) Spanish: Minor. (Marden.) Class. Jour. Club. (Smith.) (Alt. Fridays.) French Syntax. (Armstrong.) Economic Theories. (Hollander.) Greek Composition: Adv. (Miller.) Seneca. (Wilson.) Italian: Minor. (Shaw.)	Chem. Jour. Meeting. (Remsen.) (9-10.30.)
10	Greek Seminary. (Gildersleeve.) Physics: Minor. (Ames and Huff.) General Biology. (Andrews.) Latin Composition. (Wilson.) French: Major. (Brush.) Classical History. (Ballagh.) French Phonology. (Armstrong.) Economics. (Barnett.) Economic Geology. (Clark.) German Reformation. (Vincent.) Ethiopic: Elem. (Blake.) Geometry. (Morley.) Historical Politics. (Steiner.)	Greek Syntax. (Gildersleeve.) Calculus: Minor. (Hulburt.) English Literature. (Greene.) French: Elective. (Critchlow.) Solid and Anal. Geometry. (Hun.) Spanish Philology. (Marden.) Experimental Geology. (Reid.) German Reformation. (Vincent.) German Seminary. (H. Wood.) Assyrian. (Johnston.) Differential Equations. (Cohen.) Seneca. (Wilson.) Italian Phonology. (Shaw.) Post-Biblical Hebrew. (Rosenau.)	Greek Seminary. (Gildersleeve.) Physics: Minor. (Ames and Huff.) General Biology. (Andrews.) Plautus; Terence. (Wilson.) French: Major. (Brush.) Classical History. (Ballagh.) French Phonology. (Armstrong.) Economics. (Barnett.) Historical Geology. (Clark.) English Reformation. (Vincent.) German Literature. (H. Wood.) Later Egyptian. (Johnston.) Differential Equations. (Cohen.) Latin Composition. (Spieker.) Historical Politics. (Steiner.)	Preplatonic Philosophy. (Gildersleeve.) Physics: Minor. (Ames and Huff.) General Biology. (Andrews.) Plautus; Terence. (Wilson.) French: Major. (Brush.) Classical History. (Ballagh.) Spanish Philology. (Marden.) Economics. (Barnett.) Experimental Geology. (Reid.) English Reformation. (Vincent.) German Seminary. (H. Wood.) Galois Theory. (Cohen.) Cicero; Ovid. (Spieker.) Italian Phonology. (Shaw.) Hebrew at Sight. (Rosenau.)	Homeric Readings. (Gildersleeve.) Physics: Minor. (Ames and Huff.) General Biology. (Andrews.) Plautus; Terence. (Wilson.) French: Major. (Brush.) Classical History. (Ballagh.) Old Spanish Readings. (Marden.) Economics. (Barnett.) Historical Conference. (Vincent.) German Seminary. (H. Wood.) Old Egyptian. (Johnston.) Differential Equations. (Cohen.) Cicero; Ovid. (Spieker.) Italian Phonology. (Shaw.)	
11	German: Minor. (H. Wood.) Civilization. (Ballagh.) Roman Epic. (Smith.) Psychology and Ethics. (Griffin.) German: Minor B. (Kurrelmeyer.) Zoology: Adv. (Brooks.) Popular Latin. (Elliott.) Theory of Functions. (Cohen.) Assyrian: Elem. (Foote.) Petrography. (Mathews.) German: Major. (Vos.) Botany. (Johnson.) French: Elem. (Brush.)	German: Minor. (Vos.) Civilization. (Ballagh.) Latin Seminary. (Smith.) Psychology and Ethics. (Griffin.) German: Minor B. (Kurrelmeyer.) Zoology: Adv. (Brooks.) French Seminary. (Elliott.) Theory of Functions. (Cohen.) Arabic: Adv. (Johnston.) Petrography. (Mathews.) German: Major. (H. Wood.) American Literature. (Browne.) French: Elem. (Brush.)	History: Oral Exams. (Ballagh.) Roman Hexameter. (Smith.) Psychology and Ethics. (Griffin.) Forensics. (Lee.) (Alt. Wednesdays.) Zoology: Adv. (Brooks.) Romance Club. (Elliott.) Solid and Anal. Geometry. (Hun.) Arabic: Adv. (Johnston.) Petrography. (Mathews.) Gothic. (H. Wood.) English Literature. (Greene.) Calculus. (Hulburt.) Physics: Jour. Meet. (Ames.) Arabic Readings. (Oussani.)	German: Minor. (Vos.) Southern History. (Ballagh.) Hist. Latin Grammar. (Wilson.) Psychology and Ethics. (Griffin.) German: Minor B. (Kurrelmeyer.) Zoology: Adv. (Brooks.) Spanish Epic. (Marden.) German: Major. (H. Wood.) German Oral Exercises. (Hofmann.) European History. (Barnett.) French: Elem. (Brush.)	German: Minor. (Vos.) American Colonial Hist. (Ballagh.) Latin Seminary. (Smith.) Psychology and Ethics. (Griffin.) German: Minor B. (Kurrelmeyer.) Zoological and Botanical Journal Club. Spanish Seminary. (Marden.) Galois Theory. (Cohen.) Old Egyptian. (Johnston.) Gothic. (H. Wood.) German: Major. (Hofmann.) European History. (Barnett.) French Phonology. (Armstrong.)	
M. 12	Physics: Major. (Bliss.) Sophocles; Lyric Poets. (Spieker.) French: Minor. (Brush.) Rhetoric. (Greene and French.) English Constitution. (Lee.) French Dialects. (Elliott.) French: Minor B. (Critchlow.) Anglo-Saxon. (Bright.) Sanskrit: Elem. (Bloomfield.) Polit. Theories. (Willoughby.) General Mineralogy. (Mathews.) Physical Chemistry. (H. C. Jones.) Physiology. (Howell and Erlanger.) Arabic Conversation. (Oussani.)	Physics: Major. (Bliss.) Sophocles; Lyric Poets. (Spieker.) French: Minor. (Brush.) Rhetoric. (Greene and French.) American History. (Steiner.) French Seminary. (Elliott.) French: Minor B. (Critchlow.) Hist. English Grammar. (Bright.) Sanskrit: Adv. (Bloomfield.) English: Major. (Browne.) Physical Optics. (R. W. Wood.) Polit. Theories. (Willoughby.) General Mineralogy. (Mathews.) Physical Chemistry. (H. C. Jones.) Physiology. (Howell and Erlanger.) Tagálog. (Blake.) Syriac. (Johnston.)	Physics: Major. (Bliss.) Sophocles; Lyric Poets. (Spieker.) French: Minor. (Brush.) Rhetoric. (Greene and French.) English Constitution. (Lee.) Dante. (Elliott.) French: Minor B. (Critchlow.) Anglo-Saxon. (Bright.) Physical Optics. (R. W. Wood.) Econom. Problems. (Willoughby.) General Mineralogy. (Mathews.) Physical Chem. (H. C. Jones.) Physiology. (Howell and Erlanger.) German Oral Exercises. (Hofmann.) Historical Geography. (Johnston.)	Calculus: Minor. (Hulburt.) German: Elective. (Kurrelmeyer.) Forensics. (Lee.) Romance Palæography. (Keidel.) Astronomy. (Huff.) Hist. English Grammar. (Bright.) Pali. (Bloomfield.) Economics. (Hollander.) Physical Optics. (R. W. Wood.) Econom. Problems. (Willoughby.) General Mineralogy. (Mathews.) Solid and Anal. Geometry. (Hun.) Physiology of Circulation. (Dawson.) Spanish: Elective. (Marden.) Botany. (Johnson.) Assyrian: Elem. (Foote.)	Physics: Major. (Bliss.) Greek Composition. (Spieker.) French: Minor. (Brush.) American History. (Steiner.) French: Minor B. (Critchlow.) Sanskrit: Elem. (Bloomfield.) English: Major. (Browne.) Physiology of Circulation. (Dawson.) Italian Literature. (Shaw.) Botany. (Johnson.) Hist. of Ancient East. (Johnston.)	
P. M. 1	English: Minor. (Browne.) Greek Composition. (Spieker.) Herodotus; Greek Comp. (Miller.) General Geology. (Clark & Shattuck.) German Conversation. (Hofmann.) Italian: Elective. (Shaw.) German: Elem. (Vos.)	English: Minor. (Browne.) Lysias; Euripides. (Spieker.) General Geology. (Clark & Shattuck.) German: Elem. (Vos.)	English: Minor. (Browne.) Lysias; Euripides. (Spieker.) General Geology. (Clark & Shattuck.) Public Speaking. (Lee.)	English: Minor. (Browne.) Lysias; Euripides. (Spieker.) Herodotus; Greek Comp. (Miller.) General Geology. (Clark & Shattuck.) Public Speaking. (Lee.) German: Elem. (Vos.)	Economics (Hollander.) Herodotus, Greek Comp. (Miller.) Italian: Elective. (Shaw.) Public Speaking. (Lee.)	
2	Sumerian Hymns. (Haupt.)	Aramaic Grammar. (Haupt.) Drawing. (Whiteman.)	Hebrew: Elem. (Haupt and Foote.) Charities. (Brackett.)	Hebrew. (Blake.) Drawing. (Whiteman.) Botany: Elective. (Johnson.) (2-5.)	Botany: Elective. (Johnson.) (2-5.) Italian Conversation. (Oussani.)	
3	Compar. Hebrew Grammar. (Haupt.) Ethical Theories. (Griffin.) (Alt. Mondays.) Physical Seminary. (Ames.) German Hist. Readings. (Kurrelmeyer.)	Old Testament Seminary. (Haupt.) English Seminary. (Bright.) Drawing. (Whiteman.)	Hebrew: Elem. (Haupt and Foote.) Old French Readings. (Armstrong.) Political Conf. (Willoughby.) (Alternate Wednesdays, 3.30.)	Hebrew. (Blake.) English Seminary. (Bright.) Drawing. (Whiteman.) German Hist. Readings. (Kurrelmeyer.)	Vedic Seminary. (Bloomfield.) History of Philosophy. (Griffin.) English Journal Club. (Bright.) (Alternate Fridays.) England and Germany, XVIII C. (Baker.)	
4	Compar. Philology. (Bloomfield.) Assyrian Grammar. (Haupt.) Experimental Physics. (R. W. Wood.) German: Elective. (Kurrelmeyer.) Lithuanian. (Ness.)	Semitic Prose Comp. (Haupt.) (4-5.30.) English Seminary. (Bright.) Drawing. (Whiteman.)	Indo-European Grammar. (Bloomfield.) Mathematical Sem. (Morley.) (4.30.)	Introduction to Vedic Lang. (Ness.) English Literature. (Greene.) English Seminary. (Bright.) Drawing. (Whiteman.)	Germanic Society. (H. Wood.) (Alternate Fridays.) English Journal Club. (Bright.) (Alternate Fridays.)	
5	English Literature. (Greene.) Spanish Conversation. (Gould.) Scientific German. (Kurrelmeyer.) Physiological Jour. Club. (Howell.)	Economic Seminary. (Hollander & Barnett.) (8 p. m., alternate Tuesdays.)	Public Speaking. (Lee.) The Philippines. (Blake.)	Old Testament Lit. (Haupt & Foote.) Scientific German. (Kurrelmeyer.)	Historical Association. (Vincent.) (8 p. m., alternate Fridays.) Germanic Society. (H. Wood.) (Alternate Fridays.)	